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Improved Pump.

The valves of pumps are generally so inaccessible that whenever they get out of order there is considerable difficulty in repairing them; the object of the invention here illustrated is to so arrange the valves that they may be readily removed from the pump for examination, repair or renewal. The plan consists essentially in making the valves in conical hollow plugs, which are inserted in the walls of the water passages, whence they may be removed at will.

HAYES'S REMOVABLE VALVE PUMP.

Fig. 1

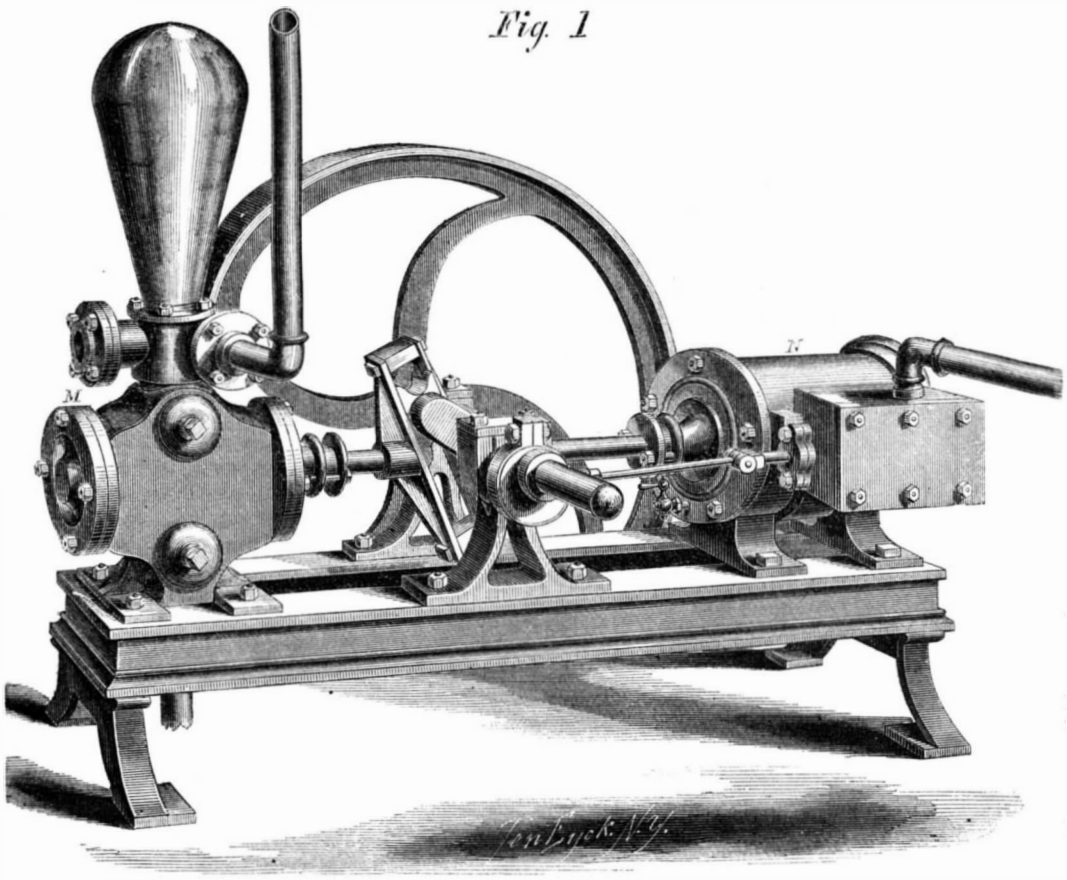

Fig. 2

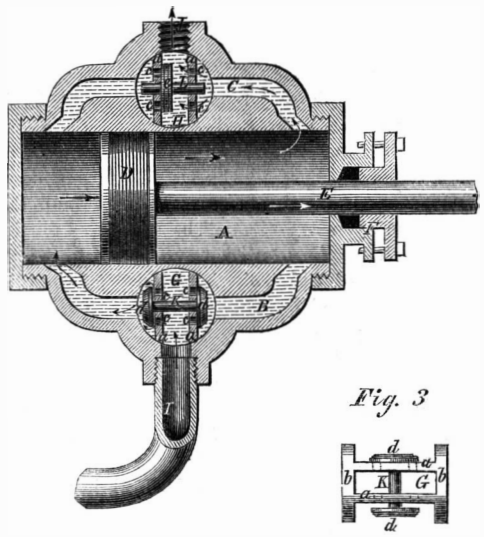

Fig. 3

The engravings represent the pump attached to a steam engine; N, Fig. 1, being the engine, and M the pump. A longitudinal section of the pump is shown in Fig. 2, and Fig. 3 is a section of the hollow plug with its valves removed from the pump.

In Fig. 2, A is the pump cylinder, D the piston, E the piston rod passing through the stuffing box, F, in the usual manner. B is the passage through which the water enters the cylinder and C is the eduction passage. A conical hole, G, is drilled through the walls of the passage, B, and into this the conical plug, Fig. 3, is fitted. This plug is formed of two circular plates, *b b*, which fit the walls of the water passage, and two rectangular plates, *a a*, which connect the circular plates together. The plug is inserted so as to bring the planes of the plates, *a a*, in a horizontal position. Through the middle of these plates holes are made for the valve stem, K, which carries the valves, *d d*, upon its ends, and around this stem, in each plate, are four other holes, *c c*, Fig. 1, for the passage of the water.

In the eduction passage, C, is a similar plug with a valve stem, L, having one valve between the plates, *a a*.

When the piston, D, moves in the direction indicated by the arrows, the valves are in the position represented, and the water is drawn into the cylinder at the left hand end and forced out through the opposite end. When the piston returns, the position of the valves is reversed, and the water is drawn into the cylinder at the right hand end.

In case either of the valves becomes worn or otherwise impaired, the conical plug in which it is held is very easily taken from the pump, and after the valve is repaired the restoration of the plug to its place is an operation requiring but little time or labor. The holes for receiving the plugs are easily made by implements in common use, and the plugs are very readily fitted to these holes, enabling the advantages of this improvement to be cheaply obtained. The valves being of the puppet kind are less liable to become worn or injured than the flap valve generally used.

This pump was invented by Dennis Hayes, of this city. The patent was granted through the Scientific American Patent Agency, March 26, 1861, and further information in relation to it may be obtained by addressing A. B. Taylor & Son, at No. 3 Hague street, New York city.

Permanent Industrial Exhibition in Paris.

A spacious and beautiful building is now being erected near the great railway station at Autenil, in Paris, for the purpose of a great Industrial Exhibition in 1863. It is also intended that it shall be a permanent exhibition of manufactures and works of art, where specimens of the products of every country will be collected, so that visitors to Paris from all parts of the world may examine them. The Ministers of Finance, Agriculture and Commerce, under the authority of Napoleon III., have issued the necessary orders to complete the enterprise. A special license has been granted for the admission of all foreign products, for the Exhibition, free of duty, with liberty to sell them on the spot on paying the regular government tariff, or to re-export them free. It is stated that the building will exceed in size the International Exhibition in London, and far surpass it in beauty. The amount of space allotted to France and several other countries has already been agreed upon. Such an institution exhibits profound sagacity on the part of the French Emperor, as it will attract foreign merchants and visitors to Paris every year.

The Salting of Brick Work.

The following information is communicated to the London *Builder* by J. S. Davies. It relates to that efflorescence which is frequently noticed on the surface of bricks:—

The question was, I think, asked some time since in your paper, whether any means could be adopted to prevent the salting of brick work. In a building to which I was architect last year, we tried, by the advice of a chemist, oiling the facing bricks with linseed oil. The oil was applied with a brush to one face and one end of each brick; and as no salting has appeared on any part of the brick work, which was finished about twelve months ago, the experiment seems to have been in this case successful.

I have found the same kind of facing bricks become salted considerably where they have been used without oiling; and from the appearance of the mortar joints in the case in question, think that the same would have occurred in the present instance, had the oiling not been adopted.

The salting of brick work is so detrimental to its appearance, that any means of preventing it is of value, and I therefore send you the result of my own experience on the subject. The oiling rather improves than otherwise the color of the brick.

THE California harvest has already commenced in the southern counties of the State, and with few exceptions the reports from the various agricultural districts continue to be highly encouraging.

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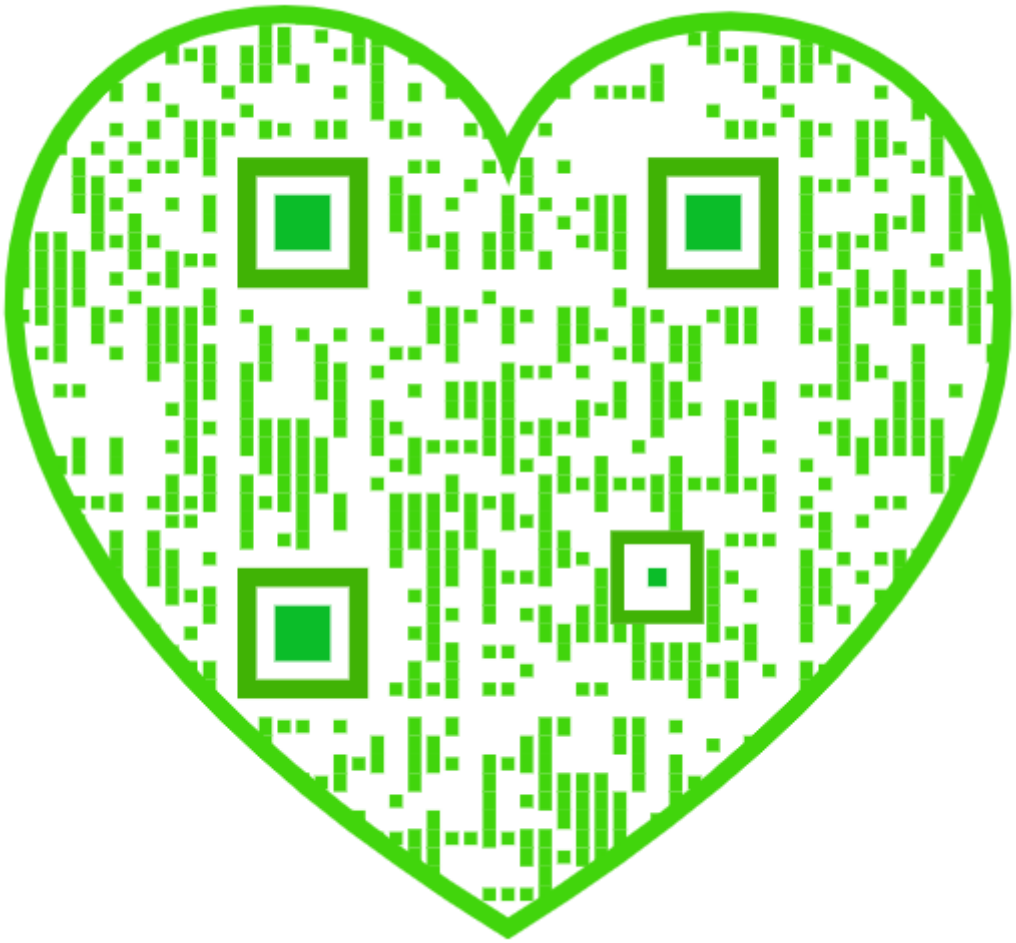

NOTES ON MILITARY AND NAVAL AFFAIRS

RESPONSE OF THE COUNTRY TO THE NEW CALL FOR TROOPS.

The Governor of Illinois has informed the President that he has a hundred companies now full, and he asks if an additional regiment ill be accepted. All over the country meetings are being held and subscriptions raised to promote enlistments.

At an enthusiastic and numerously-attended meeting, held in Bridgeport, Conn., on the 17th ult., Gov. Buckingham was present, and made a characteristically forcible speech. Hon. W. D. Bishop, exmember of Congress, and formerly Commissioner of Patents, also made a stirring address. He concluded by offering a subscription paper to the audience, and this is the way it started off :—

Wheeler & Wilson Manufac. Co.	$5,000	Treat & Blake	$200
F. A. Benjamin	1,000	J. Mott & Co	200
C. Spooner	1,000	Eben Fairchild	200
Wm. D. Bishop	1,000	J. D. Alvord	100
Elias Howe, Jr.	1,000	J. G. Adams, M.D.	100
Nathaniel Wheeler	1,000	S. C. Patterson & Co.	100
Hanford Lyon	1,000	W. G. Sterling	100
D. H. Sterling	500	Hall & Read	100
J. C. Loomis	500	Wm. A. Booth	100
Russell Tomlinson	500	Sherman Hartwell	100
P. C. Calhoun	500	S. C. Booth	100
P. T. Barnum	500	J. S. Hanover	100
F. Wood	250	H. M. Hine	100
Wm. H. Perry	250	D. W. Thompson	100
S. S. Clapp	200	James Wilson	100
H. N. Hayes	200	Horace Nichols	100
Hayward & Bacon	200	R. B. Lacy	100
E. Birdsey & Co.	200	S. B. Ferguson, Sr.	100
Dwight, Chapin & Co.	200	S. J. Andrews	100
		Samuel Larkin	100

The sums of $75 and $50 which were subscribed are too numerous to mention.

About 300 men have joined the Fourteenth Regiment, now at Camp Foote, Hartford, and the ranks are fast filling up. The National Union Committee of New Haven has established seven recruiting offices, and all are meeting with success, and filling up the ranks of the Lyon Regiment. The sum raised for the benefit of the regiment will probably reach the required amount of $15,000. The Meriden Britannia Company has offered $50 bounty to any of their workmen who will go to the war, with a promise of employment on their return. Other firms at Meriden have made liberal offers. The town authorities have voted $50 to each volunteer. In a few days it is expected that a full company of 100 men will be enrolled at Meriden.

Rev. Jonathan Brace, D. D., of Milford, has offered to give $10 to each person who will enlist from that town, and if a full company is formed there, he will give them $500 additional.

At a large and enthusiastic town meeting, held at Hartford on the 19th ult., the sum of $100,000 was appropriated for the aid of the families of volunteers who have or may enlist in the town, for the aid of the sick and wounded, and for promoting enlistments.

About forty-eight thousand volunteers under the new call are already enlisted.

GENERAL CURTIS'S FORCED MARCH.

On the 24th of June General Curtis was at Batesville on White River in the northern interior of Arkansas, when the river fell so as to cut off his supplies, and he decided to march to Helena on the Mississippi river about 90 miles distant in a straight line. His advance reached Helena on the 12th of July, and it is said that the remainder of his army have since arrived.

OUR LOSS IN THE RECENT BATTLES BEFORE RICHMOND.

Before the late movement against Richmond was begun, the five *corps d' armée* of the army of the Potomac were nearly equal in numbers, except that Fitz-John Porter's (on the extreme right), after the arrival of McCall's division, was about half as strong again as the rest. What this original strength was it would not be proper to state, nor what our late increase has been.

Our losses in killed, wounded and missing, from June 26th to July 1st inclusive—Mechanicsville to Malvern—were as follows :—

	Killed.	Wounded.	Missing.	Total.
Sumner	170	1,068	848	2,086
Heintzelman	189	1,051	833	2,073
Keyes	69	507	201	777
Porter	873	3,700	2,779	7,352
Franklin	245	1,313	1,179	2,737
Engineers	..	2	21	23
Cavalry	19	60	97	176
Total	1,565	7,701	5,958	15,224

REBEL RAIDS AT THE WEST.

As was anticipated, Colonel Forrest was not able to get the prisoners he captured at Murfreesboro in Tennessee, away with him. The officers were carried off but the privates were parolled. The most important of these raids was that of Colonel Morgan with 2,500 men into Kentucky. He captured Midway, a small town in the northern interior of the State, 14 miles northwest from Lexington. Another band proceeded to Henderson on the Ohio river, and actually succeeded in crossing into Indiana and capturing 250 of our sick soldiers at Newbury. This expedition is remarkable as effecting one invasion of a Northern State. The daring invaders very quickly retired.

A LITTLE GUNBOAT FIGHT AT VICKSBURG.

Our last account left Commodore Davis's fleet just above Vicksburg and Commodore Farragut's just below ; the short distance between the two fleets commanded by the rebel batteries being the only portion of the great river not under our control. On Tuesday, the 16th of July, the rebel iron-clad steamer *Arkansas* came out of the Yazoo river, a stream which empties into the Mississippi on the east side a little way above Vicksburg, and ran down through Commodore Davis's fleet. She was armed with 12 rifled 68-pounders and made a spirited fight. She encountered first the *Tyler*, *Carondelet*, and ram *Lancaster*. After a running fight of ten miles the *Carondelet* closed with the rebel, and both vessels grounded, fighting side by side. The rebel, being outside, succeeded in getting off. The *Tyler* steamed ahead, maintaining a running fight until the fleet was reached. Our transports being in range, preventing an effective fire from our gunboats, the *Arkansas* succeeded in getting to Vicksburg under shelter of the batteries there. The total Union loss is twenty-seven killed and wounded, and among these are the engineer and pilot of the *Tyler*. Slight damage was done to our vessels. One steel-pointed shot passed through the *Arkansas*, and this was the only damage that she received. There seems to be no prospect of taking Vicksburg without a large infantry force.

A BRILLIANT CAVALRY DASH.

A large portion of the supplies for the great rebel army at Richmond, pass over the Virginia Central Railroad, which runs from the city north-westwardly, into the richest portions of the State. General Pope determined to break this line of communication. The following is his official report of the operation :—

HEADQUARTERS OF THE ARMY OF VIRGINIA,
WASHINGTON, July 21, 1861.

To Hon. E. M. Stanton, Secretary of War :—

The cavalry expedition I directed General King to send out on the 19th has returned. They left Fredericksburg at 7 P. M. on the 19th, and after a forced march during the night made a descent at daylight upon the Virginia Central Railroad, at Beaver Dam creek, twenty-five miles west of Hanover Junction, and thirty-five miles from Richmond. They destroyed the railroad and telegraph line for several miles, burned up the depot, which contained forty thousand rounds of musket ammuntion, one hundred barrels of flour and much other valuable property, and brought in a captain in charge as a prisoner. The whole country was thrown into a great state of alarm. One private was wounded on our side. The cavalry marched eighty miles in thirty hours. The affair was most successful, and r flects high credit upon the commanding officer and his troops. As soon as full particulars are received I will transmit to you the name of the commanding officer of the troops engaged.

I am, sir, very respectfully, your obedient servant,
JOHN POPE.
Major General Commanding.

The regiment that performed this service is the Harris Light Cavalry, of this city, Col. Davies commanding.

THE ENFORCEMENT OF THE CONFISCATION ACT.

WAR DEPARTMENT, WASHINGTON, July 22, 1862.

First—Ordered, that military commanders within the States of Virginia, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas and Arkansas, in an orderly manner, seize and use any property, real or personal, which may be necessary or convenient for their several commands, for supplies, or for other military purposes; and that while property may be destroyed for proper military objects, none shall be destroyed in wantonness or malice.

Second—That military and naval commanders shall employ as laborers, within and from said States, so many persons of African descent as can be advantageously used for military or naval purposes, giving them reasonable wages for their labor.

Third—That as to both property and persons of African descent, accounts shall be kept sufficiently accurate and in detail to show quantities and amounts, and from whom both property and such persons shall have come, as a basis upon which compensation can be made in proper cases; and the several departments of this government shall attend to and perform their appropriate parts toward the execution of these orders.

By order of the PRESIDENT.
EDWIN M. STANTON, Secretary of War.

CHANGE AT MILITARY HEADQUARTERS.

General Halleck has been called from the Western Department to Washington and it is announced that he is to occupy the position of General-in-Chief of our armies. There is some hope that this step will lead to concentration of force, uniform and determined policy, and vigor of action ; in place of the dilatory and feeble spirit that has characterized our military operations ever since the beginning of the war.

Parson Brownlow's Sketches of the Rise, Progress, and Decline of Secession, with a Narrative of Personal Adventures among the Rebels. Published by George W. Childs, Philadelphia.

This is one of the most interesting political works which has issued from the press of this country for many years. If in some respects we think it contains occasional expressions which we may deem a little too strong and which occasionally border on the profane, we ought not to forget that it is the language of a man who feels strongly the ruin which unbridled ambition and reckless folly have brought upon the country at large, but more especially upon the Southern States. Let us not forget that it is the outspoken language of a man who has suffered both in property and person because of his devotion to the good old flag of his country and to the Union one and indivisible ; that he suffered imprisonment for many months, that all his substance and that of a large family have been swept away by the rebels, because he dared in the face of the most fearful odds to go forward and do battle almost single handed and alone against those who were plunging the country into rebellion ; and that he witnessed scenes of persecution, violence, and cruelty on the part of the rebels toward Southern men who loved the Union, and said so, better than the caricature of a Government which Confederates would substitute in its place—scenes which, if truly described, make the blood run cold, and look as if the South under the new *regime* was turned into a perfect pandemonium. What wonder therefore that Parson Brownlow's denunciation should be bitter and that he should sometimes forget that decorum which, under other and happier circumstances, might be expected from him.

The book is valuable as a matter of reference upon Southern politics generally, and will stand out as a bold outline of the history of the inception, inauguration and progress of the great rebellion. It is beautifully brought out ; is printed on excellent paper, in large elegant type, is illustrated with numerous wood cuts, together with a very fine steel engraving of the "parson." It is hardly necessary to recommend such a work to the American public. We understand that Parson Brownlow is pecuniarily interested in the sale of the work, and considering that in his bold and unflinching defence of the Union he has lost all his worldly goods, the public owe him a debt of gratitude, and without any loss on the side of the public or any compromise of personal respect on the side of the author, we think that to patronize the volume would be a laudable way of manifesting that respect for Mr. Brownlow which his patriotic labors so eminently deserve.

Another Shooting Trial at Armor Plates.

We learn by the latest news from England, that another experiment was lately made with the Armstrong 300-pounder smooth-bore gun at Shoeburyness, against iron plates, at a range of 200 yards. The target presented a portion of the side of the new class of steam frigates. The armor is 5½ inches thick, instead of 4½, as in the *Warrior*, but the thickness of the teak backing is reduced from 18 inches to 9. For the first three trials the shot was of cast iron, and the charge 50 pounds as usual. No. 1 struck and pierced the center plate, damaging but not passing through the inner skin and framing. No. 2 struck the upper plate, and went completely through armor, timber, and skin. No. 3 was directed against the lower plate, and, like No. 2, passed quite through the target. At the fourth round the gun gave way, the breach being blown backward to a distance of 30 or 40 yards. The gun did not break into fragments, and no one was hurt.

GRAPE CULTURE.—The cultivation of grapes is a delicate but simple and beautiful art. The summer dressing of the vines is absolutely essential to perfect success, and may be learned from plain printed directions. The whole subject is practically treated in 'Phin's Open Air Grape Culture," published by D. M. Dewey, of Rochester, N. Y.

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THE STEVENS BATTERY.

Mr. Stevens has addressed the following notes to Congress. As the objections to the Stevens battery are very pointedly stated in the communications, with Mr. Stevens's replies to them, we give them a place in our pages. Since we examined this vessel, in its present condition, we have been of opinion that if the best talent and skill of our shipbuilders and mechanics should be employed to finish it on plans which they should devise, it might be made the most efficient ship of war in the world :—

To the Hon. Charles B. Sedgwick, Chairman of the House Committee on Naval Affairs:

SIR :—The whole Board, last appointed by the Secretary of the Navy, unanimously reported that with certain modifications, the Stevens Battery could be made "an efficient steam battery." This fact will also appear in their separate detailed reports. If this is conceded, is it not better to complete the vessel with these modifications, rather than sacrifice the half a million of dollars already invested by the Government? If, however, the Committee believe this risk is too great to be encountered by the Government, which is equivalent to an abandonment of the vessel and all the money already expended by them, then why not accept my proposition to finish the vessel at my own cost and risks, giving the Government the option to take her, if successful, when completed, for the sum already appropriated by Congress. In this case, the Government would have the benefit of all my improvements, without any risk on their part. I have failed in my efforts to procure the full detailed individual reports of the Board, but have been furnished, by a friend, with the following abstract :—

From the Report of Commodore C. H. Davis, President of the Board.

1. Guns should be inside of the casemate.
2. Heavy Parrott guns should be substituted.
3. Smokestack should be permanent.
4. Side armor below 21 feet deck should be strengthened and carried lower.

The above parts are not yet built, but are all capable, and are all reported upon as capable of these modifications, without alteration of, or interference with the parts already built.

From the Report of Mr. S. V. Merrick.

1. Guns should be put inside the casemate.
2. Cabins should be under the 21 feet line.
3. Shielding should be stronger, and run farther down the sides.
4. The vessel should terminate where the shield does.
5. The vessel may be used as a ram by being strengthened forward.

All the above modifications may be made without alteration of the present vessel.

6. The sides below water may be pierced by a ram. Cannot be protected against a ram.

This objection applies to every war vessel in the world, if hit by a ram below the side armor at any angle approaching a right angle. The only possible protection of any vessel's sides against a ram, is to prevent their being so struck. This vessel is unanimously admitted to have unequaled speed and power of turning, thus either avoiding or glancing the blow.

7. Great draft is a serious, though not a fatal objection; few harbors would admit her.

See answer to similar objections, made by Colonel Delafield.

8. Great length would be fatal if it were not for two propellers.
9. The speed will be great, but is over-rated.

The speed is admitted by both Boards to be greater than that of any war vessel in the world.

10. Great sacrifice made for speed.

Since the vessel has room and buoyancy enough to carry everything necessary, there is no "sacrifice."

11. Ends of vessel are dead weight, and weaken the ship.

See answer to Colonel Delafield's objection to weakness of vessel.

12. Loading by steam is complete and ingenious.
13. Speed and power of rapid evolution are all that could be desired.
14. If finished on Mr. Stevens' plans, it would not be protected against shot.
15. A gun discharged while loading, might sink the vessel.

If the modifications suggested by the Board were adopted, the last two objections would not exist.

From the Report of S. M. Pook, Naval Constructor.

1. Draft should be limited to 19 feet, by raising gun deck two feet, and omitting all above.
2. Guns too heavy; should be lighter; ten in number, and placed inside the casemate.
3. Armor on the sides should be thicker (four and one half inches at four feet down), and run down eight feet.

These parts are not yet built, but can be modified, without alteration of parts that are built.

4. It will be an experiment whether thin sides are sufficient (for strength.)

That there is no defect in this regard is proved by the testimony of the builders of nearly all the iron ships in America. See Memorial, page 7.

5. Discharge of guns in loading dangerous.
6. Not more than one gun at a time can be fired parallel with the keel.

The arrangement of the guns, and the objection to it, are avoided in the modifications suggested by the Board.

7. This vessel will excel in speed any iron-plated vessel yet built—importance of great speed admitted.

From Report of Col. Richard Delafield, concurred in by Mr. Moses Taylor.

Concurs in the report of the whole Board, that the vessel can be so modified as to make an efficient steam battery.

1. Draft too great—should not exceed 14 or 16 feet.

The sailing draft is 20½ feet. The draft the vessel may assume when fighting, is 22½ feet, and is much less than that of any European or sea-going iron-clad vessel. The battery can be relieved to a draft of 17 feet 2 inches, and thus taken over bars, and enter our principal Atlantic harbors. The chart of New York harbor shows that there is nothing in this objection as far as that harbor is concerned.

2. Bottom and sides have but one row of rivets. The vessel may break in two.

The strength of the vessel is certified to by the builders of nearly all the iron ships in America. See memorial, p. 7.

3. Armament should be under the casemate, with ports on the sides and ends.
4. Ram should project 15 feet forward below the water line.
5. It may be necessary to have the sides one foot higher and the timber on sides carried lower.
6. Guns should be adapted to elongated shot, and of uniform bore.

All the modifications suggested in the four paragraphs above can be made without alteration of or interference with the parts already built.

7. Fifty feet should be cut off from each end of the vessel.

This is the only modification suggested by any member of either Board that cannot be made without altering parts already built. The only result of this change would be to greatly increase the draft of the vessel and make her slow. The *Great Eastern*, *Scotia*, *Persia*, *Australasian*, *China*, and other fast, modern sea-going steamers, are of almost precisely the same sharpness as the Stevens Battery. The *Great Eastern* is nearly twice as long as the Stevens Battery, and the *Scotia* and *Persia* of nearly the same length.

8. Filling the coal bins with water deprives the vessel of fuel when most needed.
9. Water could not be put in bags on the 21 feet deck, on the eve of action, and water on this deck endangers the ship.
10. Noxious vapors from the chimney may be drawn into the blowers.
11. When there is no ventilation, except through the grating, this may be submerged by a wave.
12. Noxious air will go through openings on the upper deck around the guns.
13. The proximity of these openings to the flue will endanger the powder.
14. Accidental discharge when guns are pointed down, will destroy the ship. Guns pointed forward or aft, will cause premature explosion of other guns.
15. Great length of primer objectionable.
16. Hydraulic apparatus for elevating and depressing the guns would break down.
17. Numerous engines used in loading liable to be destroyed, and to be out of order.
18. There is no evidence that gutta percha springs, to take up the recoil of guns, will remain uniform.
19. The guns could not be served by men on deck, on account of smoke from depressed chimneys and the blast of the other guns.
20. Optical instruments for sighting the guns liable to obscuration.

All risk of the defects indicated in the thirteen foregoing objections would be avoided if the Government would complete the vessel and adopt the modifications suggested by the Board, since my improvements in mounting and working ordnance, and in settling the vessel and protecting the twenty-one feet deck by water, would not be used. I need not therefore reply to these criticisms, except to say that most of them have been disproved by actual trial.

I believe these comments demonstrate the practicability of completing the Battery, with the modifications suggested by the Board, without any change in the vessel so far as already constructed, retaining all of the materials now used, and with no loss of the work already done.

The perilous condition of the country, whether we look at home or abroad, imposing such weighty responsibilities, seems to demand from Congress final and immediate action.

Having now performed my whole duty to the Government and people, during many years of patient endurance and sacrifice, both of time and of money, and having, as I believe, successfully encountered all objections, I now conclude by presenting these views and alternative propositions, and submit the case to the consideration of the Committee.

E. A. STEVENS.

Washington, July 4, 1862.

Hon. John P. Hale, Chairman of the Committee on Naval Affairs, United States Senate :

SIR :—As the Honorable Secretary of the Navy has reported to Congress against finishing the Stevens battery on the plans proposed by me, I have now to propose, either that the Government pay me the amount advanced by my brother and myself, and finish the vessel on such plans as they think best, relieving me of all responsibility; or else that they release to me their claim to the vessel, and I will finish it at my own risk and expense within eighteen months, under a penalty of one hundred thousand dollars, and the Government can take it after it is finished, if, in their opinion, it is a success, at the amount estimated for its completion, viz., $783,294.

E. A. STEVENS.

Washington, June 26, 1862.

Brilliant Whitewash.

Many have heard of the brilliant stucco white wash on the east end of the President's house, at Washington. The following is a receipt for making it, as gleaned from the *National Intelligencer*, with some additional improvements learned by experiment :—

Take half a bushel of nice unslacked lime, slack it with boiling water, cover it during the process to keep in the steam, and add to it a peck of clean salt, previously well dissolved in warm water; three pounds of ground rice, boiled to a thin paste, and stirred in boiling hot; half a pound of clean glue, which has been previously dissolved by first soaking it well, and then hanging it over a slow fire, in a small kettle with a large one filled with water. Add five gallons of hot water to the whole mixture; stir it well and let it stand a few days covered from the dirt. It should be put on right hot; for this purpose it can be kept in a kettle on a portable furnace. It is said that about one pint of this mixture will cover a square yard upon the outside of a house, if properly applied. Brushes more or less small may be used, according to the neatness of the job required. It answers as well as oil paint for wood, brick or stone, and is cheaper. It retains its brilliancy for many years. There is nothing of the kind that will compare with it, either for inside or outside walls. Coloring matter may be put in, and made of any shade you like. Spanish brown stirred in will make red or pink more or less deep, according to the quantity. A delicate tinge of this is very pretty for inside walls. Finely pulverized common clay, well mixed with Spanish brown before it is stirred into the mixture, makes a lilac color. Lampblack in moderate quantities makes a slate color, very suitable for the outside of buildings. Lampblack and Spanish brown mixed produce a reddish stone color. Yellow ochre stirred in makes a yellow wash—but chrome goes further, and makes a color generally esteemed prettier. In all these cases, the darkness of the shade will of course be determined by the quantity of coloring used. It is difficult to make a rule, because tastes are very different; it would be best to try experiments on a shingle and let it dry. It is said that green must not be mixed with lime. The lime destroys the color, and the color has an effect on the white wash which makes it crack and peel. When walls have been badly smoked, and when you wish to have them a clean white, it is well to squeeze indigo plentifully through a bag into the water you use, before it is stirred in the whole mixture. If a larger quantity than five gallons is wanted, the same proportions should be observed.

THE Telegram so well described by our correspondent, Septimus Piesse, is that produced by the Needle Telegraph, an English invention. No such telegraph is used in America. The Recording and Sounding Telegraphs are exclusively used on American lines.

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PETROLEUM---REFINERIES---EXPLOSIONS.

Number IV.

[Concluded.]

Crude petroleum is exported in large quantities from the oil regions to various places, where it is refined and rendered fit for common use. A large number of refineries are situated in the vicinity of New York, and other places far distant from the scources of supply. It is evident that all the refuse of the refinery is just so much extra expense involved in carrying the crude article, and it is reasonable to conclude, that if it were refined in the vicinity of the oil wells, where coal is abundant and cheap, a great saving would be effected. On the other hand, we must take into consideration the cost of transporting from the seaboard those chemicals used in refining. These chemicals principally consist of sulphuric acid and caustic soda. The acid is manufactured in various chemical establishments, and in the vicinity of New York, in large quantities at Bushwick, L. I., in the extensive chemical works of the Mayor of Brooklyn, Martin Kalbfleisch, Esq. A number of refineries have been erected in several of the villages in the oil regions. In distilling petroleum, a very light oil passes over at first, when the heat is low. This is the liquid commonly called benzine, and is the volatile dangerous fluid that has been the cause of so many explosions. It is a powerful solvent, and will dissolve resins and grease. The temperature of the still is subsequently raised, and the whole of the petroleum is distilled, leaving a residue of bitumen. The distilled product is afterward agitated in a vessel with warm dilute sulphuric acid, is allowed to settle, then run off into another vessel where it is washed with water. It is then agitated with caustic soda in solution, washed with water, and submitted to a second careful distillation which finishes the operations. If these are carefully conducted, the oil obtained will be nearly as colorless as alcohol. Some specimens of petroleum are rendered very pure by one careful distillation. Various opinions exist among refiners respecting the kind of stills which should be used. Oils of different specific gravities are obtained from petroleum according to the temperatures to which it is subjected during distillation. That which passes over at a temperature of 302° Fah., according to the experiments of Professor B. Silliman, Jr., has a specific gravity of .733 (three lower than sulphuric ether); that which has been obtained at 320° has a specific gravity of .752; that at 338° Fah., .766; at 392°, .800; at 518°, .854. Pure alcohol has a specific gravity of .815. As several eupion oils obtained from petroleum are lighter than alcohol, we can thus form a very correct idea of their volatile character.

We will close these articles by presenting some information relating to the explosive character of petroleum. Laws have lately been passed in New York, and also in London, prohibiting the storage of petroleum, except in buildings suitable for the purpose, and in situations where other property is not endangered. This is right; still several erroneous notions prevail in the community respecting this fluid, which deserve to be corrected. For example, some persons believe that if a match is brought into contact with this fluid in a barrel, the whole will explode like a keg of gunpowder. This is not the case. No hydrocarbon fluid will explode while in the liquid state. It must first be evaporated, then mixed with seven or eight volumes of atmospheric air before it will explode, when a lighted match is applied to it.

Several weeks since, a committee of the Brooklyn City Common Council, was appointed to search into the causes of a petroleum explosion which took place in Williamsburgh, L. I., and to collect information on the explosive nature of this fluid. They examined several witnesses who gave their experience, which we present in substance, on account of its scientific value.

Professor Eaton, of New York, stated that petroleum is not liable to spontaneous combustion; that the light gas which evaporates from the crude material, on exposure to air is vaporized naphtha; that no benzine proper is obtained from it; that the article called benzine, said to be distilled from it, is not true benzine, and that various oils obtained from petroleum have not been named by chemists.

Mr. Mowbray, a pratical chemist, presented the following statement of the parts of crude petroleum:

Naptha, Benzine or Benzole, technically "Light Ends"	15
Light oil, specific gravity 60° to 55°	12
Light illuminating oil, specific gravity 54° to 50°	10
Medium illuminating oil, specific gravity 49° to 46°	25
Heavier illuminating oil, specific gravity 45° to 40°	20
Heavy oil, precipitating paraffine 1.3 when exposed to temperature of 40° Fahrenheit	12
Loss	6
Total	100

On the examination, Mr. L. B. Page made some experiments to show that oils should not be ranked dangerous according to their specific gravity. His apparatus consisted of a cup of water in which was inserted another cup of the capacity of three ounces. Into this the bulb of a thermometer was inserted, to indicate the degree of heat generated by a spirit lamp placed directly under the cup containing water. The first experiment was with refined oil, at 50° Baumé. When the thermometer indicated 118° the oil commenced to vaporize, so that it would catch fire from a lighted paper; but it was not until 124° had been reached that the oil itself would take fire when burning paper was applied.

The second experiment was with refined oil, at 43° which took fire at 87°.

VALUABLE RECEIPTS.

Bronzing.—This art consists in communicating to various articles in metal, wood and plaster, the appearance of bronze. Antique bronze possesses a peculiar greenish color, which is due to oxide formed on bronze figures, which have been exposed for a long period to the action of the atmosphere. A green bronze liquid, to imitate the antique, may be made with two parts of verdigris and one part of salammoniac, dissolved in vinegar, then boiled for fifteen minutes, filtered through paper, and diluted with water. Articles of metal to be bronzed, are immersed in this liquid until they acquire the peculiar green tinge desired, after which they should be carefully washed and dried in sawdust. Copper bronze powder is prepared as follows:—Strips of copper are dissolved in nitric acid, in a glass vessel, and then strips of iron are added to the acid, when the dissolved copper is precipitated to the bottom of the vessel in the form of a very fine powder. This powder is then washed with water and dried, and may be used for bronzing. Another bronze powder called *aurum mosaicum* is prepared as follows:—One pound of tin is first melted in a crucible, and then poured cautiously into half a pound of mercury, contained in an iron dish. When cold, it is reduced to powder, and mixed with seven ounces of flower sulphur and half a pound of salammoniac and triturated in a mortar. The mass is then calcined in a flask, when the sulphur, mercury and ammonia are expelled, leaving the tin in the form and color of a bright, flaky gold powder. This is the basis of many bronze powders. It may be converted into a reddish bronze powder by grinding some red lead among it, or into a greenish bronze by grinding some dry verdigris with it.

Bronze powders are put on with a size made by boiling about four ounces of gum animi to every pound of pure linseed oil, in a flask, until it becomes the thickness of cream, after which it is diluted with turpentine for working with the brush. The article to be bronzed is first covered with some of this size, and when nearly dry, a piece of soft leather is wrapped round the finger, dipped into the powder, and rubbed gently over the article. The powder may also be rubbed on with a camel's hair pencil, and then left to dry thoroughly, after which, all the loose powder is brushed off. Bronze may also be applied in the moist state by mixing the bronze powder with a strong solution of isinglass, and applying it with a brush like a varnish.

Wood is bronzed by first coating it with several coats of strong size made of the skins of animals, such as the parings of parchment. Prussian blue, raw umber, and yellow ochre, or pipe clay, are usually mixed with the size, to give it what is called body. Two coats of the size, the one dried before the other is put on, are generally applied to wood, and before the last coat is fully dry, the bronze in powder is applied with a fine brush, and allowed to dry perfectly, after which it is rubbed with a woollen cloth. For articles exposed to the atmosphere, the linseed-oil size is the only one which must be employed. A mixture of any of the common dry paints, blue, yellow, or red, with *aurum mosaicum*, will produce any desired color. Bronze powders, mostly manufactured in Germany, are imported in considerable quantities, and may be obtained wherever artists' materials are sold. They can be applied to bronze, metallic or plaster articles in any of the modes prescribed.

Black Copying Paper.—Make a stiff ointment with fresh butter, or lard and lampblack, by stirring it about fifteen minutes in a cup. Now smear this evenly over soft writing paper with a piece of clean flannel, and wipe off the surplus with a dry cotton rag; then dry it in a warm room. It is used by placing it upon a sheet of white paper, laying the pattern to be copied upon it, and then tracing the figure with a style.

Clean Tracing Paper.—This paper is made with Canada balsam, dissolved in turpentine, and applied with a brush to the surface of the sheet; after which the paper is hung upon a fine thread line to dry. If not sufficiently transparent, a second coat like the first may be given. When the second coat of balsam varnish is dry, the surface of the paper should be rubbed with a mixture of equal parts of nut oil and turpentine, and afterward with wheat flour, which must be all carefully wiped off again with a clean rag. The sheet is then hung upon a line again and thoroughly dried.

Credits in the Iron Business.

A meeting of those engaged in the iron trade of Pennsylvania was held at Philadelphia on the 15th ult. for the purpose of taking into consideration the credit system. A large number of letters were read from men engaged in the trade in Pennsylvania, New Jersey and New York, all of which favored the reduction of credits from six to four months. A series of resolutions were unanimously adopted, recommending that the reform be inaugurated on the 1st of August, that sales for cash shall in all cases imply a settlement within ten days; that the discount for cash shall not exceed four per cent; that settlements shall be made in currency equal in value to United States legal tender notes, and that the members pledge themselves to give these resolutions their hearty support. There were fifty establishments represented from different parts of Pennsylvania, but none of the Pittsburgh manufacturers were present.

Mineral and Jewel Riches of India.

There was lately sold at auction, in Calcutta, the following articles which were taken as prizes at Kerwee, by Sir George Whitlock and a detachment of the Indian army:—One necklace, consisting of 92 rose-cut brilliants, perfect alike in color, water and symmetry, let into 94 emeralds of the richest green without a flaw. A number of ingots of pure gold, weighing from 320 to 500 ounces; a small model of a Hindoo temple in gold, with all the utensils for sacrifice, weighing 580 ounces. A solid silver temple, elegantly gilt, weighing 650 ounces, while idols of silver and gold, and statuettes representing elephants, lions, vultures, &c., abounded. Besides these there were several bags full of gold coins, some of them very ancient, the whole valued at $3,250,000.

New Iron Bridge in Portugal.

Railways are now being constructed upon a commendable scale in Portugal. A beautiful bridge crossing the river Tagus, on the Lisbon and Badajoz Line of Railroad, has lately been finished. It was constructed in 18 months. It is formed entirely of iron, and it has 16 openings, each of 100 feet span. The piles on which the structure is placed are composed of two cylindrical iron tubes, 5 feet 4 inches in diameter, and they have been sunk at a distance of about 6 feet 8 inches from each other. For the purpose of securing greater solidity and strength they are strongly bound together with ironwork. In two months locomotives will thus be enabled to cross the Tagus at a hight of more than 50 feet above the ordinary level of the river.

The value of labor-saving machinery at the present time is shown in the harvest fields. Such is the scarcity of laborers in the country, owing to volunteering for the war, that the harvest could not be gathered but for these machines, which are more in use than ever this season.

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MISCELLANEOUS SUMMARY.

THE PEARL FISHERY OF PANAMA.—The Panama *Bulletin* remarks :—The Pearl Islands are situated about 60 miles from this city. The business is yearly increasing in importance, and to some of the more fortunate managers it is highly profitable. One or two of the enterprising merchants who are engaged in this business have perfected their arrangements to prosecute it on a more extensive scale than ever before. The submarine armor recently imported from London by Mr. Steffins is the most perfect apparatus of the kind ever used on the Pacific. We hope that in their submarine explorations of the "unfathomed caves" they may find many a gem.

CALIFORNIA SONG BIRDS :—The Tuolumne *Courier* says :—We have several species of the oriole or thrush, which abound in these mountain districts, that are pleasing songsters and of beautiful plumage. Some of them have the golden plumage of the canary, set off with streaks of black, white and crimson. Another species is of a grayish brown color, the male having the head, neck, and shoulders tinged with blood red. The male of this variety sings well.

DESULPHURATION OF IRON IN PUDDLING :—Professor Richter (in *Dingler's Polytechnisches Journal*), of Loeben, Styria, recommends the oxide of lead (litharge) for this purpose; and in an experiment in which 4 pounds of litharge were added to 865 pounds of iron, 4 pounds of sulphuret, and ¾ of a pound of phosphuret of iron, the results were wholly satisfactory, the iron being entirely soft and malleable. The operation was moreover finished in much less than the ordinary time.

OHIO WOOL CROP.—Wool men estimate the clip of the State of Ohio this year to be about 13,000,000 pounds, being 2,000,000 pounds greater than the clip of last year. Of this probably about three-fourths have been sold at prices averaging 48 cents, leaving the finer grades unsold. The sales of wool, with the transportation and incidental charges, will bring more than $7,000,000 of gold currency into the State.

PROMPT ACTION.—When the news of the rebel guerrilla raids into Kentucky, under Morgan, reached Cincinnati, 2,500 men from Ohio, and as many more from Indiana, were thrown into Kentucky at a few hours' notice. The specie in the banks at Lexington and Frankfort, amounting to about five millions of dollars, has been transferred to Cincinnati for safe keeping.

TIN is one of the most ancient metals—that is, it was well known to the ancients; and it is very well established as a fact that the Phœnicians, those olden masters of the sea when Tyre was in her glory, made voyages to Cornwall, and obtained tin from the mines in that district long before Britannia was known to the Romans. It was this tin, alloyed with copper, which formed the old bronze armor of the Asiatic warriors.

STEAM CULTIVATION IN ENGLAND.—The Staffordshire *Advertiser* says :—A gentleman informs us that he saw, a few days ago, from a spot in the neighborhood of Sutton Maddock, in this county, no less than five steam cultivators at work on adjoining farms. These facts illustrate not only the rapid growth of steam culture, but equally the enterprise of the Salopian farmers.

THE Washington Navy Yard, under the direction of Captain Dahlgren, has become the Ordnance Depot of the naval service. The anchor and chain shops have been transformed into manufactories of heavy ordnance, and the large rifled cannon cast in Pennsylvania are sent there to be bored, rifled and finished.

A CORRESPONDENT in Richmond, Ind., writes as follows :—The machine business never was better in this part of the Union than at present. The war has done one good thing for us, in bringing about a cash system in place of the old credit system. The SCIENTIFIC AMERICAN comes regularly and is the standard paper with us.

THE Belfast, Me., *Journal* learns from a dealer in the wooden-ware line, that there is now more call for spinning wheels than at any time the past twenty years.

A BILL has been introduced into the British Parliament providing for the safe keeping of petroleum and any product that gives off an inflammable vapor at a temperature of less than 100° Fah. Not more than 25 gallons are to be kept within 100 yards of a dwelling house or warehouse, except under special license from the municipal authorities.

Two armor-plated gunboats of 600 tuns measurment have lately been built in London by private contract for the Danish Government. On their trial trips they attained a speed of 11½ knots per hour in smooth water.

QUITE A COMFORTABLE INCOME.—Among other celebrities in London, is Baron Steiglitz, the great Petersburgh banker, who is declared to be the richest individual in the world. His annual income is estimated at over two and a half millions of dollars.

THE Mont Cenis tunnel through the Alps is the joint work of the French and Italian Governments. The French are to pay $3,800,000, the Italians $41,000,000 of the entire expenses.

GRAPES.—The grape crop of California promises to be unprecedentedly large this season, and arrangements on a greater scale than ever are making for the manufacture of wine.

Manufacture of Rice Starch in England.

The following is condensed from the communication of a correspondant of the *Chemist and Druggist*, London. The works described are at Norwich, England. The raw material of which English starch is manufactured is chiefly rice, which is acted upon by caustic alkali to disintegrate its cellular tissue. The small grains grown in Madras and Bengal are usually employed for the sake of economy, but any of the varieties of rice known would yield nearly the same proportion of starch. The rice used in this particular factory is floated up the river Wensum, and hoisted directly from the vessels to the upper story of the building. Whence it descends by shoots into huge iron cisterns, in which the "liquor," or solution of caustic soda, is prepared. Under these, on another floor, are the vats in which the rice is acted upon by the alkali until the hard grains are rendered so friable they may be rubbed to a powder between thumb and finger. It is cheaper, however, to use millstones. The steeped rice is ground with water, and from each pair of stones runs a continuous stream of the starch material, which now appears as a thick, creamy liquid.

The creamy product, which contains all the insoluble constituents of the rice in a finely divided condition, is now placed in deep tanks called "separators," and mixed with a large proportion of water. Each tank is provided with a long narrow window of plate glass, through which the contents can be seen; and inside each there is an agitator, to which a rapid motion may be given at any time by connecting it with the train of machinery which runs through the factory. The cream of rice is first agitated in these tanks until its particles are well diffused through the water. The agitators are then stopped, and gravitation is allowed to do the work of separation. The particles of skin, fiber and gluten slowly subside, leaving the minute starch granules suspended mechanically in the water. When the separation is complete, the starchy water is decanted from the sediment, and pumped up through tubes of gutta percha to immense shallow vats in the upper part of the building. These are called "settling becks," and are lined with zinc and refilled with the starchy water every day, and the deposited starch is cleared out twice a week.

The mixture of fiber and gluten left in the separators is sold for pig food. A set of hydraulic presses are constantly at work squeezing this nutritious material into compact cakes, which can be packed in a comparatively small compass, and transmitted to the hungry pigs of remote parts.

The starch paste is passed through sieves to free it from any accidental grit, and then poured into cloth-lined troughs, to drain and consolidate. When sufficiently hard, the starch is cut into cubical blocks, each about five inches in diameter, and removed from the troughs. Following the blocks we come to a large room around which are arranged a number of hot closets or stoves. The first and largest of these closets is called the "crusting stove," and into this the cubes of starch are carried and placed in regular rows upon the shelves. After having been exposed for some time in this Turkish bath to a temperature of 140° Fah., the blocks are removed and the surface crust is carefully scraped off each. The clean blocks are now packed in paper, tied up, and labeled as though they were just about to be sent from the factory, but they are carried away and placed in a hot apartment, where the moisture is all driven off, and the cakes become crystalline. These cakes when compressed slightly in the hand crumble into the innumerable starch prisms which are so well known to all. The starch is now put up in boxes ready for the market, but it is not sold generally until it is some weeks old, because it becomes heavier by absorbing moisture from the atmosphere, than when taken out of the drying room.

There is very little rice starch manufactured in the United States. Wheat, corn and potatoes are the common vegetable substances from which it is made, but the processes are nearly similar for the whole, excepting the use of a caustic alkali in the vats for setting the granules of starch free from the nitrogenous parts of the grain. Alkali is used in the manufacture of corn starch, but not in wheat and potatoe starch. Rice starch takes a much longer time to settle in the becks than either wheat or corn starch, because the granules are much finer.

Balloon Accidents.

During a celebration at Sparta, Ohio, on the fourth of July, Mr. T. H. Westbrook undertook to make a balloon ascension. His balloon had not ascended more than three or four hundred feet, when it burst and turned inside out and fell with rapid motion, striking the ground about thirty rods from its starting point. The unfortunate æronaut struck the ground feet foremost, his heels going through the close wicker work of the side of the car, and sinking to the depth of nearly two inches. He was immediately taken out of the car in a totally unconscious condition. One of his legs was broken, and the internal injuries to vital parts of his body and brain precluded all hope of recovery.

A large balloon containing four persons, lately made an ascent from Boston, and drifted out above the harbor, when the balloonists let off the gas, and came down in the water. They were followed by a steamtug and taken on board, after receiving a severe ducking, and being nearly drowned.

Condition of the Cotton Market.

The demand for cotton in this city continues very active and the market has lately been somewhat excited. The sales have all been at advanced rates. The sale of Government cotton on the 19th ult. was very spirited, and 567 bales sold from 44½ to 50½ cents, including 260 at the latter rate. The prices range as follows :—Middling, 49½@50½ cents; good middling, 50½@51½ cents.

During the week ending the 19th ult., the arrivals were, from

Liverpool	680 bales.
Vera Cruz	50
Aspinwall	446
Port-au-Prince	11
Matamoros	385
Providence	44
Per railroad	731
Per North river	246
Total	2,593 bales.
Total imported since July 1st	8,299 bales.

Several qualities, such as "middling fair" and "fair," are not in the market,

Running Deer Target.

At the great national rifle match lately held at Wimbledon, England, a noval target was introduced by the Scottish riflemen and mountain deer hunters. A deer of life size made of plate iron was mounted for the target on a long embankment, and it was moved behind by mechanism so as to pass rapidly before the marksmen. The London *Engineer* states that the mechanism is highly ingenious, and the shooting was of a very exciting and difficult nature, and entailed forfeits as well as prizes. A bullet striking the deer in a vital part, entitled the marksman to a share in the entrance fees and fines; a bullet hitting the haunch, subjected the marksman to a fine.

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Correspondence

Probable Invention of a Novel and Great Motor.

Messrs. Editors:—The undersigned, through the columns of your admirable paper, respectfully requests permission to announce "glad tidings," which would appear to promise well for suffering humanity, his country, and the world generally. Moved by the distressing calamities caused by the explosion of steam boilers, and the general call of mankind for a more compact and economical motor, the undersigned has devoted nineteen years of the best days of his life (and sacrificed his health), to the admittedly good and great purpose of endeavoring to invent and discover a *perfectly safe* actuating engine, of sufficient power, compactness, simplicity and economy, which, in accordance with his predetermined and original brilliant conception, should consist of a motive engine requiring and employing *no confined power*, and be complete in the working cylinder and furnace chamber thereof; also using (if possible) neither inflammable gases or liquids, gasometers, steam-boilers, air-pumps, or any dangerous or bulky adjunct, or costly substance.

And, after the invention of about thirty complete motive engines, and several hundred improvements connected therewith, and the construction of several experimental models thereof, in his due progress onward, during his long labors of years aforesaid, of overcoming the great known difficulties thereof, it would now at last appear demonstrated, from the data, elaborate plans and drawings, specifications and a neat miniature and mechanical working model thereof, all by his own hands, in the due course of time progressively, and in order prepared and constructed, that he has been enabled to succeed.

This brilliant development (to the Creator belongs all glory, and all have their diversified gifts of talent, to be employed, it is believed, for the good of humanity and glory of God) and elegant life safe motor, is operated upon the mild principle of the sufficient and always present force of the much admired atmospheric pressure, and is of the power of Watts' and Newcomen's engines—of less simplicity of construction, occupying considerably less space, and without their boilers aforesaid—possessing the simplicity of the "gas engine" (the most compact of motors), combined with the safety of the air engine, without its bulk—in fact, as aforesaid, exceeding the latter in safety, and suitable, it would appear, for manufacturing and purposes of propulsion generally, from the operation of a "spindle" to the moving of great ships of the ocean, for which latter purpose it is particularly applicable.

It affords the undersigned also pleasure to state, that he has submitted his said invention to the deliberate examination and opinion of well known judges, of the first standing, qualification and experience (especially known as learned and interested impartially in the important "field" of the motors) in the public estimation, and that they have been enabled to give the opinion, upon his said atmospheric engine, that they are "unable to discover why it should not operate well," and that they think "favorably of it," &c., and also upon the question of novelty, that "it is new to them," &c.

The undersigned has been induced to make the above announcement at this present time, and thus lay aside any natural reserve, by the occurrence of another late steamboat boiler explosion, indeed most calamitous and agonizing—the "Mound City"—and out of mercy for the future of humanity, beloved friends, "tender and little ones," to do all in his power to save, if possible, from the cruel torment and sudden death, caused by the explosion and contact of escaping "pent up steam," occasioning sufferings even surpassing those of war.

In due time, if possible, the undersigned hopes to be enabled to publish drawings and illustrations of his beautiful discovery, and elegant life safe atmosphere motor, aforesaid. Geo. Sibbald.

Punching Iron Plates.

Messrs. Editors:—In Vol. VII., No. 2., of the Scientific American, you have an article entitled, "Penetrating Armor Plates and Punching Iron."

The writer says "Now in this operation there is a law known to every boiler maker. No force will drive a punch through a plate, unless it be of greater diameter than the thickness of the plate." "Here then we have a law which applies to projectiles in the shape of cannon shot, which are punches propelled by the explosive force of gunpowder."

This conclusion, however correct it may be in regard to the guns now used by the Governments of both Europe and America, does not hold good in the case of the accelerating gun. An accelerating rifle of one half-inch diameter of bore has repeatedly shot a steel bolt through the best forgings of one inch in thickness that could be procured for the purpose, without cracking said forging or breaking the shot. Why then should not an accelerating gun of six inches diameter of bore, burning a proportional charge of powder and propelling a shot of proportional weight, penetrate through twelve one-inch forgings or a 12-inch forging?

I will call in a few days and leave you a wrought-iron plate of 1-inch thickness, penetrated by a shot considerably less than one half of an inch in diameter, together with the shot.

W. P. Lyman.

New York, July 19, 1862.

[The statement of the writer in the *Mechanics' Magazine* is not absolutely correct in its application to punching, as we explained at the time we published the statement; but our explanation was accidentally omitted by the printer.—Eds.

Groved Frictional Gearing.

Messrs. Editors:—We have noticed several articles in your paper on "Frictional gearing," and wish to substitute it for a short belt 18 inches wide, running 4,000 feet per minute, conveying 60-horse power, which we wish to increase. Where is such gearing used, and what is the greatest amount of power conveyed by any one set? Where is such gearing made? And would you recommend frictional gearing in preference to cog gearing where the surfaces would run over 3,000 feet per minute to convey 100-horse power. Pusey Brothers.

Wilmington, Del., July 14, 1862.

[Our correspondent makes some important inquiries respecting frictional gearing. They are such questions as can only be answered from thorough practice, and this has not been obtained yet, so far as we know, with this kind of gearing. In England groved friction gearing has lately come into extensive use, but not with our machinists. We have been informed that it is only employed for driving machinery not exceeding eight or ten-horse power. For light machinery and for short connections it is said to be preferable to cog gearing and belting. We publish the communication of our correspondent for the purpose of drawing more general attention to this interesting subject.—Eds.

The Fusees of Watches.

Messrs Editors:—I lately saw an allusion in your "Notes and Queries" to American watches; I will give some of my information on the subject. The English do not use the fusee in watches for giving equal motive force, as this is now a minor consideration. Watch makers well know that the impulse arc must be reduced until the balance starts from pure motive force alone, otherwise the watch will set and start again and deceive the wearer. By omitting the fusee in a watch the impulse arc must be reduced to prevent a set in the last twelve hours as well as in the first twelve hours. The fusee takes the superfluous force from the first twelve and adds it to the last twelve hours, thus permitting of a longer impulse arc. The "detached principle" can be made tolerably isochronal and avoid the fusee, still this principle loses ground. I am sorry that American watches unite this principle to the toothed barrel. To the "dead beat" principle and large impulse arc, the fusee is not of much use; I have discarded it in very flat eight-day watches.

J. Muma.

Hanover, Pa., July 14, 1862.

California Statistics.

The Gold and Silver Mines.—The San Francisco *Mercantile Gazette and Price Current* says:—

The mines of this State are paying very handsomely this season. In some places they are being more fully and successfully developed than ever before. In Shasta county, near Janesville, claims are paying $5 to $17 per day to the hand. Good paying claims are also opened at Union Flat in the same neighborhood. A quartz mill on Sugar Pine creek near by, cleaned up, according to the report, which has reached us, about $6,000 after four day's run.

The Nevada *Democrat* reports the opening of new and rich quartz mines in that vicinity. A mill has been constructed in that county for crushing a sort of cement known as the "blue lead," which, after thirty hours' run turned out $2,700. This lead was formerly very unproductive, and lost the owner several thousand dollars. Thus, by the use of improved machinery and the better knowledge acquired by experience, mining operations are paying better. Similar advices come from other portions of the State.

New placers have been discovered near the Colorado, and about 900 miners are now at work there. The great drawback to a large yield is the want of water. All the gold is gathered by the process called "dry washing." The dust is coarse, varying from the size of small shot to that of peas, and often larger. It is rough and much mixed with quartz, having generally one smooth face and the angles worn as if considerably washed since liberated from the rock. Its standard value, when free from quartz, is $18 50 per ounce. The gold is found in drift near the surface, along the ravines, and in fissures among the rocks, the deepest diggings not being as yet more than a few feet below the surface. It lies very uneven, being mostly in pockets and crevices. A large wooden bowl, a long broad flat knife, a pick and a shovel. are about all the tools a miner requires in gathering this gold.

No less than 3,840 pounds of bullion have arrived in San Francisco from Washoe in a single week, and yet mining operations in this part of the country have just begun. Many new quartz mills are going up in it. An iron foundry has been established on Gold Canon between Gold Hill and Silver City. It turns out heavy castings and machinery for quartz mills. Esmeralda is sending some of its mineral wealth to San Francisco. The Esmeralda *Star* says:—

The vast mineral wealth of Esmeralda is deposited in four principal hills lying contiguous to each other. At the foot of these, spreading like an amphitheater around her, lies Aurora, which needs only capital to render it one of the richest of our silver mining districts. Silver Hill contains the Esmeralda Ledge, a mass of crystallized quartz, fifty feet in hight, sparkling like gems, forming a beautiful coronet, and encircling the brow of the hill. This ledge is the mammoth one of all: it averages about fifty feet in width and crops out from twenty to fifty feet in hight; it is full of rich blue veins, which are yielding largely of silver, with but a small per cent of gold.

Copper.—The Stockton *Independent* of June 7th says that the shipment of copper ore from Copperopolis to Stockton averages 30 tuns per day, at $8 per tun. The ore sells at $100 per tun. $240 per day, or $6,000 per month, would go far toward paying the running expenses of a railroad from that point, leaving wholly out of the account increase of freight and passenger travel. Twenty-three teams laden with copper ore were passed on the road recently by an individual between Copperopolis and Stockton.

The clipper ship *Rambler* lately sailed from San Francisco for Boston with 500 tuns of copper ore.

Coal.—The Humboldt *Times*, of June 7th, says that an extensive coal mine has been discovered in Mendocino county, right on the embarcadero. Men were engaged preparing the excavations for a mill site and wharf, when they struck the ledge.

Loss in Melting Gold Dust.—The Grass Valley *National* says that owing to sulphurets or foreign matter, the loss in melting gold is much greater than formerly, It ranges from 4 to 6 per cent. This has had the effect to reduce the price of ravine and sluicing dust from 25 to 50 cents per ounce.

Honey Harvest—The Stockton *Independent* says:—

The greatest honey harvest of which we have ever heard or read, has just been gathered from his hives by Mr. Hamilton, who lives in this county, a short distance from French Camp. The total amount is five tuns, and it is the finest and purest quality of comb.

Wool in Tulare.—The Visalia *Delta* says that one sheep owner in that county has this year sent $5,000 worth of wool to San Francisco, and it advises farmers to breed none but the finest-wooled sheep as they are most profitable.

Machinery.—The Vulcan Iron Works Company, in San Francisco, has made and shipped a steam engine of fifty-horse power, with all the necessary appurtenances and fixtures for a flouring mill at Guadalajara, in the State of Jalisco. Also a steam engine of thirty-horse power, with apparatus complete, for a sugar plantation at Hermosillo, in the State of Sonora.

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A TELEGRAM.

BY SEPTIMUS PIESSE.

A message sent to a distant place by means of certain motions from a balanced needle of iron is now termed a *telegram ;* a word coined from two Greek words, *tele*, at a distance, and *gramma*, a letter of the alphabet ; or *grammata*, used in the plural, as *literæ*, in Latin an epistle.

As it is impossible to explain by any physical, material, or mechanical method why a needle of iron moves under particular conditions, we must endeavor to make this phenomenon understood by analogy.

When a person is frightened, or caused to start, under the impression that he hears or sees something, but which, after the effect of the fright has passed away, is often attributed to fancy or to imagination, we may say that there was an inducing cause, although we are not able to say what was the cause. This action on the nervous system is produced by induction ; that is, something "leading into." There are numerous inducing causes, producing known effects ; and yet we make no progress in our endeavors to ascertain the cause that induced the effect. We know that laughter is catching ; that one person gaping in a room will set the whole company yawning ; that a boy with a slate-pencil, scratching on a slate, will set one's teeth on edge ; that the sight of a youth eating sour gooseberries will make another boy's mouth water ; that the fear of one soldier will produce a panic in an army ; and that one brave man or woman will sometimes save a city from destruction. For all these effects we have a word of explanation, "sympathy ; that is simultaneous action, without contact.

Now this answers the purpose of explaining the movement of the magnetic needle, when a current or stream of electricity is flowing near it ; but the scientific term of this kind of activity is "induction." A stream of electricity, passing along a wire, will "induce" that effect which we call magnetism in a bar of iron near to it, provided the bar of iron is set or laid at right angles ; that is, crosswise, or in an opposite direction to the stream or current of electricity. More practically to explain the phenomena of the telegram, we must borrow a few reels of cotton (No 16 !) and two or three of those slight bars of iron which those nimble fingers are ceaselessly twisting wool round, and then slipping off again, till a mitten or a baby's sock is produced.

Let us imagine that the reel of cotton represents a reel of telegraphic wire, and unwinding some of it suspend it across the room, being careful not to break it off the reel. There is a hole, as everybody knows, through the middle of the reel, and into this we put our crotchet needle, which is to represent the future magnet. Supposing we could send a stream of electric fluid through our cotton conductor, the result would be, that the crotchet needle would, by induction, become magnetized (that is, magnetic) so long as the stream of electricity lasts ; but as soon as the stream of electricity ceases, the crotchet needle would no longer be magnetic, but would return to its original condition, and become again a bar of iron. Well, then, having learned that we can make and unmake a magnet as quick as lightning, the whole difficulty of comprehending the magnetic telegraph is overcome, because all the remaining untold incidents connected with it are more generally familiar, or at least can be learned by the aid of a sixpenny magnet.

The first fact to learn is, that one magnet makes many. If we bring our sixpenny magnet near to a dozen or more sewing needles, laid upon a sheet of paper, we shall soon perceive them magnetised, moving in all sorts of ways towards the great magnet ; and it must be mentioned here, that where magnets are of equal weight, there is no more tendency in the one to move toward the other than in the other ; the apparent activity of a needle on the approach of a large magnet is consequently relatively no more than the magnet itself when their mutual weights are considered. We must now show how to illustrate at home the action of an invisible magnet upon a needle.

First fasten down the sixpenny magnet upon a square piece of wood, and then lay it upon the table ; over the magnet put a sheet of paper, upon the upper side of which are marked several letters at different points. Then suspend a small darning needle, by means of a fine thread fastened to its center, from any convenient position close over the paper, and the needle will quickly turn till it hangs directly over the magnet. If the board upon which the magnet is fixed is moved round, it will be observed that the suspended needle, being free to move, will follow the motion of the magnet, and thus point to any letter marked upon the paper ; and if the needle is thus made to point successively to the four letters, L-O-V-E, we have sent or seen our first telegram.

Turn we now in our minds to a Telegraph Office. There we see a clock-looking sort of apparatus, a face and some letters upon it, and in the front a needle moving upon its center. Behind the dial, and therefore invisible to the public, is a bar of iron, and wound round it is a bobbin of conducting wire. Any person causing a stream of electricity to flow through the wire bobbin, causes by induction the bar of iron to become a magnet. "One magnet makes many," and the little needle on the dial becomes magnetic, and is attracted. It moves toward the great magnet behind the dial ; but there are pins and stops which arrest its progress beyond a certain point. The stream of electricity being turned off, the magnetism ceases, and the needle regains its perpendicular position, because it is suspended so to do. Again electricity flows, and again the magnet is made. This effect can be repeated quicker than a musician can strike the different keys of a piano.

As the motion of the needle itself is limited, letters are indicated by attracting the needle repeatedly in this or that direction, like the nod and the shake of the head, implying negative and affirmative, or the shrug of the shoulder, which is doubtful. The business of the telegraph clerk is to interpret signs ; but our remarks here are only to give an idea how he makes the signs. As yet, we have only spoken of the power of a stream of electricity to induce magnetism. As to the making and generating of electricity, so that we can pour it down a wire at will, there are almost as many means of doing so as there are of putting a candle out. We may observe, however, that the plan mostly favored is that of a galvanic battery, which will make any quantity of electricity on demand, and ceases to generate it when the apparatus is not in use. In the cellar of the Telegraph Office there is a galvanic battery between this station and that, and wires are laid at each end. This wire is continued like a bobbin round a reel, in the core of which is the iron bar, and is then led down into the moist earth, like the drawing room bell wire which goes down into the kitchen. In the early days of the electric telegraph, after the wire had turned round the bobbin with its core of iron, it was continued home by a return wire ; whence it was thought that two wires were considered absolutely necessary to make a communication ; but it was afterward found that the moisture of the earth, being a conductor, would act between the stations as well as a return wire. Hence the latter is now dispensed with. This brings us to notice a fact regarding electricity itself; namely, that it will not go down a wire into the country unless there be a certain means of coming home again. This is curious, but true. No telegram is sent from London to Edinburgh without the same electricity returning simultaneously to the earth wire in London as the needles beat at Scotland. If you ask why this is, I can only answer, I must tell you another time, for the printer has brought my telegram to a full stop.

Culture of Fish.

Stephen H. Ainsworth of West Bloomfield, in New York, who is well known as a successful fruit grower, is also, it would seem, devoting his attention with equal success, to the breeding of fish. The editor of the Rochester *Democrat*, who visited Mr. Ainsworth recently, gives the following account of his operations :—

The pond covers something over sixty rods of ground, and is filled by conducting the water from thirteen different springs, in the tile laid under ground, and brought into pools a short distance above the pond. At the bottom, large stones are placed in positions to afford hiding places for the trout whenever they chose to retire from the hot sun. In this respect Mr. Ainsworth has studied the habits of his finny stock, and as far as he could, compensated them for removing them from their native streams in Victor, Springwater, and other places, where they were captured. The walls around the pond are carried to the height it is intended the water shall reach, and then a sufficient quantity of earth placed over them to sustain shade trees, a large number of which are in a thrifty condition. The water comes into and passes from the pond through fine sieves, through which nothing but the water can pass.

It is so far as we are advised, an unsettled matter how many fish can live in a given quantity of water. Mr. Ainsworth has placed nearly eleven hundred trout in his pond, and some additions have been made by the process of artificial fecundation, and this process he will continue to follow until his pond is sufficiently stocked. The spawn last year placed in the pools prepared for the purpose was mostly covered with sand or washed into still water, so that from thirty thousand eggs only about one hundred young fish—now an inch long—have been discovered. He will no doubt be more successful with future experiments. We have an impression that the most successful experiments have been made by using a succession of boxes, through which the water runs over gravelly bottoms, and into which the sand and earth is not washed. If it were possible to protect all the spawn deposited by the small number of trout now left in our streams, we should quickly see them restocked to their full capacity. But it is known that even under the most favorable circumstances only a few of the eggs hatch, and of those which do much of the product is devoured by snakes, water fowl, and the larger fish. It would be a very easy matter to resort to artificial fecundation, by which an immense quantity of the most beautiful and delicate fish known in American waters could be raised.

But to the sport. Both bait and fly were taken the instant they touched the water, and had a hundred hooks been upon each line, each one would have its victim. They were of various sizes when put into the pond two years ago. Those of three years are now plump pounders. A majority are of three-fourths and a half pound. Mr. Ainsworth knows their ages as well as those of his colts and cattle. In swift running water, however, they do not grow as rapidly ; they are longer and less plump. There are a few two and three pounders, but here as in other waters, these seldom honor the angler's hook with a nibble. Of course we could not think of following up the sport for more than a few minutes, just long enough to try the game of the ten noble fellows which were seen in the show window of the Arcade House yesterday. And they were game. Every one of them made the rod bend and tremble. The females were invariably returned to the water. But more exciting sport remained. The food for their evening repast was now dealt out by spoonsful at a time, and the moment it struck the water dozens of great fellows darted for it. They knocked against one another under the water, and a person standing close to the edge would in five minutes be well "spattered" from head to feet. The "whipping" had made them a little more shy than usual, but they will feed from the hand of their owner and leap from the water when shown their food upon a spoon.

The Largest Boilers on the Lakes.

The Detroit *Tribune* says :—During the last two or three days, the new steamer *Morning Star*, of the Detroit and Cleveland line, has been lying at Williams & Co.'s dock, for the purpose of receiving the immense boilers built for her by the Detroit Locomotive Works. These boilers will be not only the largest afloat on the Western waters but several of our most eminent steamboat owners pronounce them the best. They are tubular boilers, two in number, with four-inch tubes and are eleven feet and five inches high in front. It is believed they have a greater fire surface, proportionally, than any other boilers ever turned out. The bottoms of the fire boxes are made of half-inch iron, inside and out. The steam drums are quite a curiosity on the score of size, being 19 feet long and six feet in diameter.

THE building attached to the woolen mill of Ingalls & Tyler, North Adams, Mass, containing the picker room, machine shop and wool room, fell with a great crash on the 9th ult., while it was undergoing repairs.

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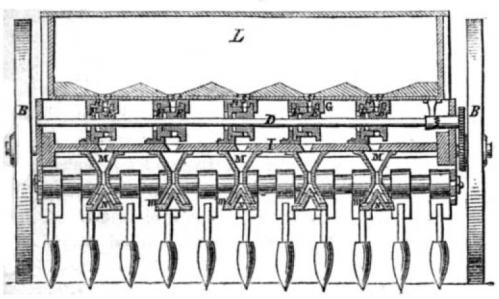
Improved Seed Planter.

The implement represented in the annexed engravings is designed for sowing seed broadcast, and while it embraces several old devices which have proved valuable by trial, it includes others of a novel character designed to obviate difficulties encountered in practice. One of these is a plan for preventing the seed from being crushed in the moving parts by which it is measured from out the hopper. This is represented in Fig. 2.

The seed is placed in the hopper, L, the bottom of which is fashioned to guide the seed into several openings, as shown. Directly below the hopper is a box in which the apparatus is placed for measuring the seed in such quantities as may be desired to the acre. A shaft, D, is geared to the driving wheel, B, so that it may receive a rotary motion on its axis, and on thisshaft is a series of cylinders, E E E, which rotate with the shaft.—There is one of these cylinders under each of the openings in the hopper, and each cylinder has receptacles formed in it to catch and measure the seed as it comes through the opening in the hopper. These receptacles are formed by taking segments from the external portion of the cylinder so as to leave radial wings projecting, between which the seed is caught and carried over to the back of the shaft where it is dropped.

In order to prevent the seed from being crushed between the cylinders, E, and the arched cap, G, which covers it, the opening through this cap for the flow of the seed is not made directly over the axis of

Fig. 2.



the cylinder, but a little back of it, and from this opening to the place at which the seed is emptied from the cylinder, a chambered recess is formed in the cap.

As it is necessary to vary the quantity of seed to the acre, provision must be made for altering the size of the receptacles in the cylinders, E E, by which the seed is measured. This is effected by coupling with each of these cylinders a movable cylinder, F, fitted to slide on the shaft, D, and having projecting segments to fit between the wings on the cylinders, E, and to fill up a greater or less portion of the space between these wings according as the cylinders, F, are brought in greater or less proximity to the cylinders, E. In order that the cylinders, F, may all be moved at the same time and to the same extent, flanges are made upon their ends to fit in grooves formed in blocks upon the bar, I, and this bar is provided with a lever for moving it endwise.

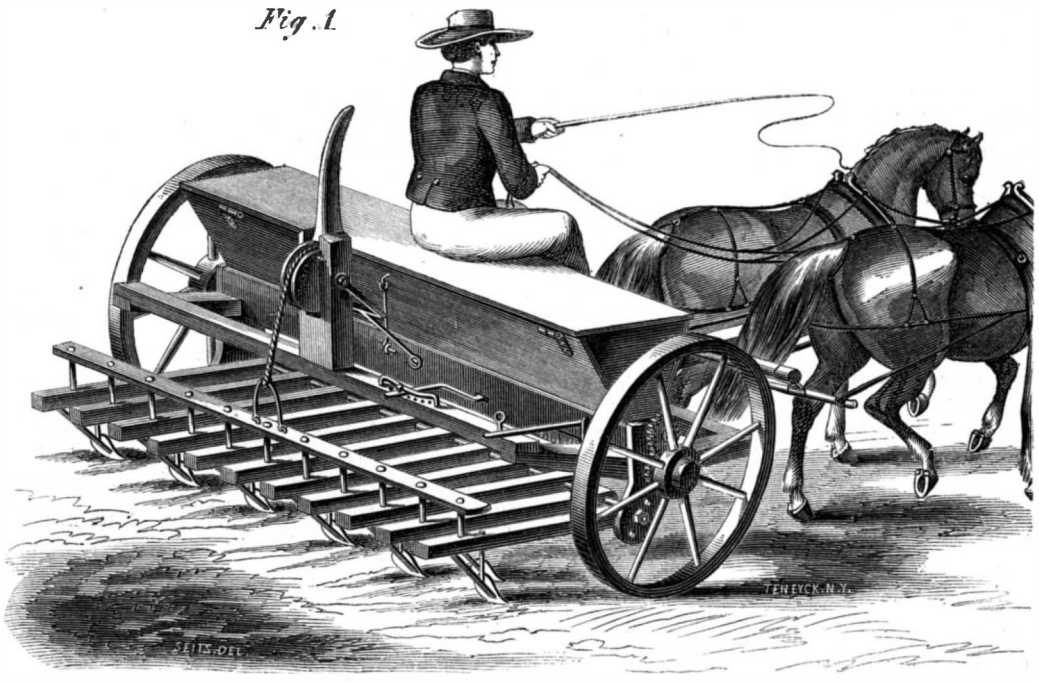
The openings by which the seed enters the cylinders, E, are varied in size at the same time that the size of the receptacles is varied. This is effected by making the portion, H, of the cap over the cylinder movable, and as this portion forms one side of the opening, the size of the opening will be varied by varying the distance of the portion, H, from the portion, G. The cap, H, is made to move with the cylinder, F, by cutting a groove in the cap for the flange upon the end of the cylinder, F, to run in.

As the seed falls from the several cylinders it would lie in drills were not some means adopted to scatter it. Accordingly cones, N N, with flanges, m, projecting around their lower ends, are suspended in the lower ends of the funnels, M, through which the seed falls.

The harrow or cultivator teeth for covering the seed are secured in horizontal bars as shown clearly in Fig. 1. These bars are attached to the machine at their forward ends by a shaft which passes loosely through them, and their rear ends are held in position by pins which rise vertically and pass loosely through a plate a few inches above them. This plate is suspended by a cord to a lever behind the driver and in reach of his hand, by which means the teeth may all be readily raised from the ground. As the pins pass loosely through the plates either of the teeth may rise independently of the others a short distance above the ground.

The patent for this invention was granted through the Scientific American Patent Agency, Nov. 12, 1861 and further information in relation to it may be obtained by addressing the inventor, George W. Van Brunt, at Horicon, Wis.

Fig. 1.



VAN BRUNT'S SEED PLANTER.

Improved Piston Packing.

We had supposed that there was one piece of mechanism absolutely perfect, that is the ring packing of pistons; but it seems that perfection is not to be written on any of the works of man. Within a few weeks we have seen two or three plans for improving the mode of constructing a ring-packed steam cylinder piston. One of these is illustrated in the annexed engravings.

Fig. 1.

Fig. 2.

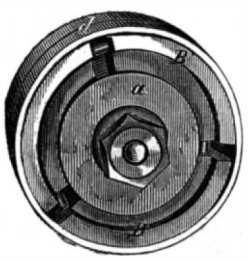
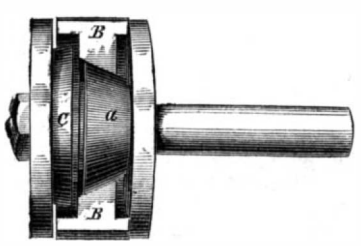


Fig. 3.



SMITH'S PISTON PACKING.

Upon the piston rod, between the piston and follower, is loosely placed a conical block of iron, *a*, Fig. 1, with a coiled spring, *c*, between it and the follower to press the cone toward the piston. The inner ring of the piston is formed in three segments, B B B, Figs. 2 and 3, the inner surfaces of which are made of conical form to fit the cone, *a*. It will be seen that the pressure of the spring, *c*, forces the cone into the ring, B, and thus carries the segments further apart, expanding the ring, *d*.

By increasing or diminishing the strength of the spring, *c*, the pressure of the ring against the sides of the cylinder may be varied at will, and the force of this spring will preserve a nearly constant pressure throughout the stroke, even though the size of the cylinder should not be uniform through its whole length. The rod, too, is kept in the center of the piston and thus the cylinder is worn alike on all sides.

The patent for this invention was granted through the Scientific American Patent Agency, May 13, 1862, and further information in relation to it may be obtained by addressing the inventor, Oliver C. Smith, at Salem, Mass.

A Successful Ice House.

C. B. Chester, of Pennsylvania, communicates the following to the *Gardeners' Chronicle*:—

Ten years since, I built an ice house. After inquiry and reflection, I adopted the following details of construction, which has proved a complete success, the supply rarely failing until ice forms again.

I chose as a location, a north-lying bank of sandy formation, made the excavation a cube of thirteen feet, or so that the earth removed would bank up to that hight, put in an eighteen-inch dry wall, except the top foot, which was mortared; inserted on each side three pieces of 3 by 4-inch scantling, to which perpendicular 1-inch pine boards were nailed as lining; put on a light shingle roof of double pitch, left the spaces at the eaves between the rafters open for a draft of air to enter, and placed a small Venetian window near the top of the north gable for its escape. Before putting on the shingles, and after nailing lath on the underside of the rafters, the intervening space was tightly packed with straight straw; the roof is kept whitewashed. The south gable consists of two doors, one of which answers for general use, but when filling, the ground being level on that side, both are opened, a small platform placed in front of them, and the ice is shot directly in from the cart. The bottom was made about one foot deeper in the middle than at the sides, and 8 to 10-inch chestnut logs laid across it close together; the ice is thrown on these.

I fill only to the square with ice, and the remaining space with wheat straw, which I am careful always to keep covered over the ice and packed down the sides a foot or two, as it melts, leaving a space of about one foot between the ice and the lining. The bank was well sodded up to the wall, so as to throw off rain water falling on the roof and prevent its ingress to the house.—Free daily use is made of the ice during all the warm season, for a family of nine, and there is usually about a load or two over. The capacity of the house is about twenty well-filled ox-cart loads, with side boards. Almost any farmer can erect such an ice house at but little expense.

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VOL. VII. NO. 5.....[NEW SERIES.].....*Eighteenth Year.*

NEW YORK, SATURDAY, AUGUST 2, 1862.

OUR NEW IRON-CLAD NAVY.

A number of our available engineering establishments are engaged at present in constructing iron-clad steamers of various kinds. Contracts have been made by the Navy Department with Capt. Ericsson for building several on the general plan of the *Monitor*, and some of these are now being pushed rapidly forward. Five are being constructed at Greenpoint, L. I., where a force of nine hundred men are employed upon them by Mr. Rowland. One is being built in Jersey City by Mr. Colwell; two by Messrs. Reany, Son & Archbold, Chester, Pa.; one at Wilmington, Del., and two in Boston. They will range in dimensions from two hundred to over three hundred feet in length with a proportionate breadth of beam. All will be furnished with revolving turrets of greater thickness than that of the *Monitor*, and most of them are to be armed with 15-inch guns. As the general form and construction of these vessels is well known, we need not occupy space with a further description of them than to state, that they are partially designed for sea service as well as harbor defence, by having hulls and engines adapted for greater speed than the *Monitor*. We understand they are also to be improved in their ventilating arrangements, by taking the fresh air down through the turret, then passing it between decks and out at the stern. Two of those building at Greenpoint will have two turrets each, the others only one. Mr. F. T. Rowland built the first *Monitor*, and has acquired great practical skill in the construction of such vessels. His yard at the present moment is like a great human apiary—full of active and industrious energy. He is also building the turrets for the two vessels that are being constructed at Chester, Pa.

Another turret war vessel of peculiar design is now being built by J. Underhill, at the yard foot of East Thirteenth street, this city. Its skeleton, which is composed of great ribs of angle iron, is now put together, some of the bottom and side plates are on, and a huge iron ram is provided for the lower part of the bow. This vessel at present somewhat resembles in form the skeleton of a huge whale. From the water line to the deck the form is like that of a long cigar, the curved sides being designed for deflecting shot. Its extreme length will be 156½ feet; breadth 36½ feet; depth of hold 13 feet. It will be provided with two revolving turrets and two powerful engines, and be driven by a screw. As it is expected to draw but eight feet of water, it will perhaps be very fast and make an efficient ram. The outside plating will be of ⅞-inch iron; inside of the ribs there is to be a course of ⅜-inch plates, then a backing of several inches of wood, and inside of all a skin of ½-inch plates. Quite a large number of operatives are now engaged on this iron vessel, and it is expected to be finished as early as some of the new *Monitors*. When the frigate *Ironsides*, at Philadelphia, is completed, the *Roanoke* at New York, and all of the *Monitor* class, we shall have a fleet of fifteen iron-clad war vessels independently of the *Galena* and a large number of iron-plated river steamers. Still, with this large number of iron-plated war vessels, which are expected to be completed by the month of November next, we must not overlook the fact that there is only one of them designed for a first-class sea vessel. They will make good coast and harbor-defence gunboats.

NEW IRON BRIDGE AT HARLEM—A GREAT PLANING MACHINE.

A new and peculiar iron draw bridge is now being constructed over the Harlem river, on the line of the Third avenue in this City. One day last week we paid it a visit, examined the works under progress and the drawings of the engineers, and judging from these, we believe that when completed it will be the greatest structure of the kind on our continent, and perhaps in the world. The necessity of building a durable bridge in place of a perishable wooden one, over this part of the river where the traffic between city and country is so great—(amounting, as we have been told, to 3,000 vehicles and 5,000 foot passengers daily)—had long been felt. It was intended at first to erect a complete stone structure, but the great depth of the tidal river, 25 feet at this point, and its very unequal bottom, containing quicksands and large boulders, offered serious difficulties to the forming of cofferdams, and laying piers of masonry in the usual way. The original design was, therefore, changed to the present one, consisting in principle in constructing massive solid abutments of masonry at each shore, and three piers in the river, formed of great cast-iron hollow columns, built up inside with masonry, all supporting three large spans, composed of iron-box girders. The total length of the bridge will be 472 feet, divided into three spans, the two side ones fixed, the central one forming a rotary draw, 218 feet in length, to permit steamboats and other vessels to pass on each side with a clear water way of 80 feet. In extreme breadth over all the bridge will be 52 feet; there will be a foot path at each side seven feet wide, and a broad central roadway for vehicles. On the New York side the abutment is finished. It is a work of substantial masonry faced with granite blocks. At the left side a flight of broad granite steps leads to the river, and a similar flight is to be laid on the right side. This will make the water front at this bridge similar to the quays on the rivers in Europe, where stone steps lead to the water for the purpose of entering small boats. Operations have not been commenced on the north shore of the river, owing to some unsettled difficulty about the land. The piers in the river are in a very forward state. The central one, for the turn table of the draw, consists of eleven cast-iron columns, each six feet in diameter, sunk and arranged in a circle of fifty feet in diameter. In the center of these is a single column forming the axis of the whole. The other two piers are each composed of a single row of five columns, the three inside ones being six feet in diameter, and the two outside ones eight in diameter each. Only one column of all these piers now remains to be sunk. The sinking and construction of the pier columns involve interesting engineering operations. A description of one will suffice for the whole. Each column is formed of sections of cast iron varying from nine to nine and a half feet in length, and two inches in thickness; and cast with an inside flange for bolting them together like pipes. In commencing to sink one of these, three sections are first bolted together, forming a column about 27 feet high. It is set perpendicularly upon a strong wooden frame in the water, and when placed over where it has to be sunk, the frame is removed with a derrick, and the column lowered upon the river bed. The other sections are afterward bolted on. It now requires to be sunk to a considerable depth below the bed of the river to obtain a secure foundation. Some columns require to be sunk deeper than others. One has been sunk no less than 35 feet 7 inches below the surface of the bottom. In order to effect this object the column is converted into a diving bell, into which the operatives descend, and excavate inside, the column sinking as the work progresses, until the proper depth is reached. This depends on the nature of the bottom of the river. The hight from bottom to top ranges from 50 to 70 feet. In order to sink a column, a large, cylindrical air-tight chamber, called an "air lock," is fastened on its top. This is provided with a door on its bottom and another on its top, and also with valves packed with india rubber. It is charged with air by a steam engine situated on a scaffold, which operates several air pumps and forces air into the lock through a flexible tube. As the air pressure increases, the water which entered the column in sinking is forced out underneath, until the bed of the river is exposed. By the peculiar arrangement of the valves and doors of the air lock, the pressure of air to keep out the water is maintained by the engine, in the column, while the men descend and excavate below, and send up the silt through the interior until the column has been sunk to its required depth. When this is accomplished, the column is filled up inside with masonry, so that when finished it is a compound of cast iron and solid masonry. The sinking of these hollow shafts has been a work of great labor and difficulty, as boulders, weighing from 1 to 30 tuns, have to be removed to permit their descent.

On the center pier, a great circular girder, forming a ring—cap 46¼ feet in diameter, 3 feet broad and 3 feet 9 inches deep, has been laid. It is to form the roadway of the draw turn table. This girder has been cast in eleven sections, and its top is now being planed in position by a planer erected for the purpose, and which is the largest we have ever seen. It resembles a revolving crane, with the center shaft in the middle column of the pier. The cutter travels round the girder, planing as it moves. It is driven by belting from the steam engine, and the cutter is made to traverse round by a pinion biting into a rack secured inside of the girder. The cutter of this planer traverses a circle of nearly 147 feet, making a revolution every six minutes. A track of smooth wrought-iron blocks will be laid upon the face of this girder, and on this the rollers of the turn-table of the draw, will be supported and travel. There will be 98 hollow rollers on the turn table, each two feet in diameter, and the draw will be composed of a peculiar triplit arched girder, with its axis in the central column of the circular pier. In position it will rest on three piers; when open it will be supported and moved on one. To allow vessels to pass, the mass of the draw to be moved will weigh about 400 tuns. Each girder for the spans will be constructed of half-inch plate iron, strengthened with angle iron. It will be a riveted, arched box, 3½ feet deep, 3 feet broad, set in cast-iron shoes, and sustained by a wrought-iron tension rod, no less than 8⅛ inches in diameter. Each span will have two girders, and the flooring will be laid on rolled needle beams or floor girders, one foot deep. When the spans are erected, ornamental balustrades of cast iron will be put up, and the whole structure, when finished according to the design, will be beautiful as well as substantial. Every precaution appears to be taken to obtain a superior and desirable bridge, by the employment of well known first-class men who have charge of the different departments, and by the use of the very best materials. The Chief Engineer is Mr. Erastus W. Smith, assistants Ethan Rogers and Theophilus Sickles. The superintendent who has had charge from the beginning of the enterprise, is Mr. James Hough; Mr. Charles V. Hough has charge of the difficult work of sinking the piers and completing their masonry. Mr. John Roach, of this city, is contractor.

When completed, this will be the first bridge in the Northern States erected on cast-iron columns. This system of bridge building was introduced to our people generally, by an illustrated description, on page 161, Vol. V. (old series 1850) SCIENTIFIC AMERICAN. It is contemplated that Harlem river will be deepened at some future day, all the way through, and that vessels from Long Island Sound will take this route to the North river.

FRANKLIN INSTITUTE.—The stated monthly meeting of the Franklin Institute, Philadelphia, was held on the 17th ult. After the usual preliminary business, William E. Brown exhibited a heat gage or pyrometer, an instrument which indicates temperatures from zero to 1000°. A metallic rod, about five feet in length, is inserted in a brass tube, and firmly secured to it at the lower end; the upper end is attached to a lever communicating by means of a rack and pinion with a pointer. The heat expands the metallic rod, and operates the pointer which thus indicates the temperature. This gage is principally used to determine the temperature of the air of blast furnaces.

THE London *Shipping Gazette* says:—The trial made with Muntz's patent metal for sheathing the bottom of ships having proved highly satisfactory, the *Royal Oak*, 51, iron-plated frigate, building at Chatham, is being sheathed with this metal.

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INVENTIONS OF THE DAY.

There are many who wonder, and inquire "What becomes of the inventions that are now so numerous, and for which so many patents are obtained? Surely," they say, "they cannot be of much worth or we should hear more about them." It is true that many things are patented which are of minor importance compared with other things, but there is not a single article patented but must show some decisive proofs of originality and usefulness.

The public must not judge lightly of the value of patents, because their virtues are not blazoned abroad continually with trumpet tongue. Let any person of experience pass in review before his mind the advancement made in the improvement of things really useful, and the value of such improvements will be felt and acknowledged. It is only by encouraging inventions that we can expect a continuance of improvement in those things useful to man. We are too prone to neglect the worthy, and be ungrateful to inventors above all others. Does the merchant who is whirled over the railroad in one tenth of the time which it once required him to travel from this to that place, ever offer up a heartfelt tribute to the inventor of the locomotive—to him who has saved him so much time and expense in performing his journey? We will answer in the negative. What man among us offers a tribute of heartfelt thankfulness to our inventor—him who, by his wonderful genius, sends a message of life-fraught importance, over a thousand miles of space, in a few seconds, bringing back on the lightning's wings, words of hope and gladness, relieving a dreadful suspense, which not long ago, would have had to endure for days and weeks? We will answer: No one. We might go on piling up name upon name of those men who have benefited every individual, by the works of their genius; but we believe that we have said enough to impress the mind of every person with the importance and value of the inventions of the day.

THANKS TO OUR FRIENDS.

The subscribers to the Scientific American whose term expired on the 1st of July have shown more than usual alacrity in renewing their subscriptions. We have them mostly all back again upon our subscription books, besides a great many new friends are bestowing upon us their patronage. To the following gentlemen we desire to express our thanks, for procuring and sending large lists of subscribers, and to others, whose names we do not give, who have sent smaller numbers, we are proportionately grateful. From the annexed named persons we have received clubs varying from fifteen to fifty subscribers during the past three weeks. The number who have sent us clubs of from six to ten subscribers are too many to find room to enumerate in these columns, but friends we are grateful to you all:—

J. W. Mount, Albion, N. Y.
Geo. Gibbs, Canton, Ohio.
J. P. Hall, Pekin, Ill.
J. E. Parker, Grand Rapids, Mich.
G. Anderson, Lansingburgh. N. Y.
W. Skene & Co., Louisville, Ky.
G. Bantz, Frederick City, Md.
R. Allen, Burlington, Iowa.
J. B. Christian, Mount Carroll, Ill.
J. K. Derby, Jamestown, N. Y.
C. Eberback, Ann Arbor, Mich.
W. F. Beecher, Chicago, Ill.
S. Thomas, Plymouth Hollow, Conn.
C. C. Dennis, Richmond, Ind.
F. A. Bishop, Placemill, Cal.
W. F. Pratt, Bristol, Pa.
S. Holmes, Bridgewater, Mass.
R. H. Fitz, St. Paul, Minn.
W. P. Martin, Woodstock, N. B.
P. W. Gates, Chicago, Ill.

The ship *Constellation*, Captain Mulliner, which arrived at this port recently, left Liverpool on the 2d of June, and after a slow and uneventful western journey, was on the morning of the 4th of July, in latitude 43° 23′, longitude 50° 15′, and also in a dense fog. Suddenly at about 1 o'clock a huge object loomed up in front of the bows, proving to be an enormous iceberg. The vessel tacked and bore away in another direction.

THE LONDON EXHIBITION.

The ceremony of awarding the prizes of the Great Exhibition took place on the 11th. The Duke of Cambridge officiated as representative of the Queen, supported by the leading members of the Cabinet, and a large number of foreign princes and dignitaries. The attendance was estimated at 100,000.

Among the awards twenty medals have been granted to American exhibitors for improved agricultural machines and implements, seven for firearms including Colt's revolvers, and one for naval architecture. This is the whole of the information which has yet reached us respecting the awards. When we receive the names of the American exhibitors to whom prizes have been granted, we shall present more information on the subject.

THE AMERICAN DEPARTMENT.

The London *Mechanics' Magazine*, in its notices of American articles says:—"Among the many useful inventions from the United States, perhaps the most remarkable is the power loom for weaving tufted fabrics. This is the invention of Mr. A. Smith, of West Farms, New York, and is intended for weaving the Axminster carpets or any other tufted or pile fabric which requires cutting and is produced from a pattern. Unlike either the Jacquard or the old draw loom, the pattern designed is formed by the arrangement of the spools which are suspended over the machine to the number of 270. These produce a pattern the whole width of the material and 1½ yards long, and at every throw of the shuttle, a piece of mechanism rises up like so many fingers, catches hold of the threads and weaves them in. A knife then passes swiftly over it and cuts off the tufts to any length required. Any design can be woven in it in parts, which when united will have the appearance of being woven in one piece, and the loom will produce twenty-five yards in one day. This loom has received great attention from scientific Englishmen and Earl Granville, who is well acquainted with weaving operations, has declared publicly that it is destined to achieve great results.

L. A. Bigelow, of Boston, exhibits several machines connected with the operations of boot and shoe making. One machine pares the leather intended for soles so as to reduce the whole to an equal thickness, another cuts out the soles at the rate of twenty pairs per minute and another machine trims the heels. The uppers are also cut out mostly by machinery. The parts of a boot having been all placed together with the sole ready to sew on, the sewing machine exhibited stitches on the soles of 150 pairs of boots per day. These machines have surprised English shoe manufacturers.

Blakes' American machine for breaking the small stones used for macadamized roads is also exhibited by Mr. Bigelow. This machine was employed for breaking the stones employed to make the walks in the New York Central Park. The London *Mechanics' Magazine* has the following respecting it: "We should like to see such a machine in use in this country. We have seen on the roadside, especially in the North, men, and even women exposed to the heat of the sun, toiling hour after hour in breaking stones for the highways, an occupation requiring no skill and remunerated at the rate of eighteen pence per day. It easily crushes flints, greenstone and the most obstinate trap to any dimensions required for concrete, railway ballast, and roads." This machine would be one of the most valuable acquisitions to England where all the common roads are macadamized and kept in the most perfect repair.

EMERY'S COTTON GIN.

In Albany, N. Y., is a family of brothers by the name of Emery, who have a large establishment for the manufacture of agricultural machines and implements. Among the great variety of machines which they make is an improved horse power, and two years ago one of the brothers took some of these machines to Georgia to sell them for use in ginning cotton. He attached two horses with one of his powers to a gin ordinarily driven by six horses, but though they would drive it when the gin was evenly fed and running smoothly, it would be very frequently choked and stopped. He thought he would try to improve the gin so as to overcome the difficulty, and taking home with him two or three tuns of cotton on the seed, he commenced a series of experiments to discover the defect. He soon found it in the roll as the cotton is fed to the saws, and remedied it by a very simple device. He also added another improvement to gather the cotton as it comes from the gin and prevent it from flying about through the air, thus dispensing with the necessity of a gin house, and rendering it possible to gin cotton in the open air. Mr. Emery is now on his way to London to show his improved gin at the Great Exhibition.

New Steamers.

We present to our readers, as below, the prominent particulars of the steamers *Creole*, *City of Norwich* and *New England*. These vessels are constructed of the best materials, and of extraordinary strength. They are peculiarly adapted for their respective routes of service, and the skill and ingenuity manifested in their erection, are regarded as of superior order.

THE PROPELLER CREOLE.

Hull constructed by Mr. Charles H. Mallory; machinery by Mr. Charles H. Delamater; route of service, New York to New Orleans, La.; owners, Messrs. Ludlam, Heineker & Co., New York.

Hull.—Length on deck, 194 feet; breadth of beam, 34 feet; depth of hold, 18 feet 7 inches; depth of hold to spar deck, 25 feet 6 inches; draft of water at load line, 14 feet; tunnage, 1,056 tuns. Frame of white oak, &c. Floors, molded 15 inches, sided 8 inches; and are 26 inches apart at their centers.

Engines.—Vertical direct; diameter of cylinders, 36 inches; stroke of piston, 12 feet.

Boilers.—One, return flue; has one blower.

Propeller.—Diameter, 12 feet; material, cast iron.

THE SIDE WHEEL STEAMER CITY OF NORWICH.

Hull built by Mr. John Englis; machinery by Allaire Iron Works; route of service, New York to Norwich; owners, Norwich and New York Transportation Company.

Hull.—Length on deck, 208 feet; breadth of beam, 36 feet; depth of hold, 12 feet 6 inches; draft of water at load line, 5 feet 3 inches; tunnage, 895 tuns. Frame of white oak, &c., and strapped with iron, diagonal and double laid.

Engines.—Vertical beam; diameter of cylinder, 52 inches; stroke of piston, 10 feet.

Boilers.—One, return tubular; located in hold, and does not use blowers.

Water Wheels.—Diameter, over boards, 31 feet; materials, wood and iron.

THE SIDE WHEEL STEAMER NEW ENGLAND.

Hull built by Mr. John Englis; machinery by Morgan Iron Works; route of service, Boston to St. Johns, N. B.; owners, Messrs. J. B. Coyle & Co.

Hull.—Length on deck, 230 feet; breadth of beam, 32 feet; depth of hold, 12 feet 6 inches; draft of water at load line, 7 feet 6 inches; tunnage, 900 tuns. Frame of white oak, &c., which is strapped with iron, diagonal and double laid, 4 by ½ inches.

Engines.—Vertical beam; diameter of cylinder, 53 inches; stroke of piston, 11 feet.

Boilers.—One, return flue; located in hold, and uses two blowers.

Water Wheels.—Diameter, over boards, 30 feet; materials, wood and iron.

Inventors Active.

There has been no period within our memory when inventive genius seemed to be developing itself faster among our people than the present. Many who never invented before, and did not know they had capacity for conceiving a new idea, have been stimulated by the success of some neighbor or acquaintance who has realized a few hundred or a few thousand dollars on some patented article, to put their wits to work. The consequence is a new crop of inventors seem to be taking the place of those formerly identified as comprising the fraternity.

We learn of a number of sales of patents in very small articles latterly at very remunerative prices.

From the Sandwich Islands.—The New Bedford *Mercury* gives the following general information of the business of Honolulu, from a correspondent:—The number of whale ships touching there has materially diminished, but other enterprises have sprung up, compensating for this loss. Many rice and sugar plantations are now in successful operation. Fine wheat is now raised, and an excellent article of flour exported. The rice, sugar, and molasses are stated to be not inferior to that produced in any other country. The vessels which run regularly between Honolulu and San Francisco find full employment. A large business consists in the export of pulu, which is a kind of brown thistle-down.

Asphaltum and a small quantity of india rubber dissolved in refined naphtha, make an adhesive cement not affected by water.

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INTERESTING REMINISCENCES.

David Wilkinson's Account of the first Cut Nails ever made—The Beginning of the Cotton Manufacture in this Country—The first Leather Belts—Proposal for a Steamboat in 1791*—Machinery for the First Canal, and many other Curious Matters.*

[Concluded from page 59.]

On my way home from Hope furnace, I called at the ore bed, in Cranston, and found Mr. Ormsbee (I think Elijah), of Providence, repairing the large steam engine, which raised the water seventy-two feet from the bottom of the ore pit. The engine was made with the main cylinder open at the top, and the piston raised with a large balance lever, as the news of the cap on the cylinder by Boulton & Watt ad not yet come to this country when that engine was built. Mr. Ormsbee told me he had been reading of a boat being put in operation by steam, at the city of Philadelphia, and if I would go home with him and build the engine, he would build a steamboat. I went home and made my patterns, cast and bored the cylinder, and made the wrought-iron work and Ormsbee hired a large boat of John Brown, belonging to one of his large India ships—should think about twelve tuns. I told him of two plans of paddles, one called the flutter wheel and the other the goose-foot paddle. We made the goose foot, to open and shut with hinges, as the driving power could be much cheaper applied than the paddle wheel. After we had got the boat nearly done, Charles Robbins made a pair of paddle wheels, and attached them to a small skiff, and run about with a crank, by hand power. After having the steamboat in operation, we exhibited it near Providence, between the two bridges; I think while the bridges were being built. After our frolic was over, being short of funds, we hauled the boat up and gave it over.

About this time, a young man called on me, and wished to see the boat, and remained a day or two examining all the works. He told me his name was Daniel French, from Connecticut. I never knew where he came from, nor where he went.

Some three or four years after we laid our boat by, I was at New York and saw some work commenced at Fulton's works, for steamboat shafts, and saw a small steamboat in North river, built by Col. John Stevens, of Hoboken. I went over to his place, and saw his boring mill. I thought he was ahead of Fulton as an inventor.

In the winter of 1814–15, hearing of a trial which was coming on before the Legislature of New Jersey, between Robert Fulton and Col. Ogden, of New Jersey, I had the curiosity to attend—as I always thought it singular that the idea of the paddle wheel should strike two persons so, at the same time, at such a distance apart; yet I knew so simple a thing might happen. I learned in Trenton, that Fulton had said he made the draft of the wheel, in London. The case in court was managed for Ogden, by Hopkinson and Southard; and for Fulton, by Emmet and Sampson. I, being a stranger there, was in the crowd to learn what I could. After the trial was over—in company with Emmet, Sampson, Fulton, and others—I took stage for New York; and, in the midst of an extremely heavy snow storm wallowed our way along as far as Jersey City, where we found all the houses full, and no mail had crossed to New York, for two days. Fulton, Emmet and Sampson took a boat, with four oarsmen, and got over by crossing the cakes of floating ice, and launching the boat several times. The boat returned with General Brown and suit. The next boat took me, with several others. Not long after I arrived home, I saw an account of Fulton's death.

About the year 1840, I was on the railroad from Utica to Albany, with an aged gentleman in the cars, and the subject of steam power came up, when I informed him of my early acquaintance with steam power, &c. He was a well-informed man, and I think, had been a member of Assembly. He said, he thought more credit had been given to Fulton, than was his due; that Col. John Stevens was more deserving than Fulton. I told him, I never thought Fulton an inventor, but simply a busy collector of other people's inventions. "Well," replied the gentleman, "I always said so, and he would never have succeeded had it not been for Daniel French." "What do you mean by Daniel French?" asked I. "Why, a Yankee," said he, "that Fulton kept locked up for six months, making drafts for him."

The name of Daniel French, burst upon my ears for the first time, for forty-nine years, and almost explained some mysteries.

In 1798, when in Philadelphia, I called in at the Museum, and saw an old bald-headed eagle walking about the yard. The keeper, who, I think, was named Peal, told me the eagle was ninety-six years before, at Halifax, or Nova Scotia, and that he would have a new bill in four years—four years after, I saw mention in a Philadelphia paper, that the old eagle had got a new bill on. I had never seen any other account of the eagle, except in Scripture—of his renewing his age, like the eagle.

In, or about 1794, Col. Naomi Baldwin came from Boston to Pawtucket, after machinery for a canal he was going to make, north from Boston. We made the patterns and cast his wheels, racks, &c., and he took them to Charlestown and finished the locks. I was there and saw the operation. It being the first canal in the country, a good deal of curiosity was excited among the people.

About this time, I saw the platform-hay scales, at Charlestown Neck, at what was called Page's Tavern. The plan of the scales was brought from Ireland, by a Mr. Cox, of Boston, who built the old Warren Bridge, from Boston to Charlestown, and who was called to Ireland to build a bridge there. On his return to Boston, he brought a three-wheeled carriage, with a Shetland pony, for his son, and the plan of the platform scales, which has been the subject of so many patents in the United States.

We cast at Pawtucket, the iron for the draw for the Cambridge bridge.

A Mr. Mills, who built the South Boston Bridge, came to me for the machinery for the bridge. I fixed the patterns, and went to Raynham, got the castings, and carried them to Boston, for the first new bridge.

Jeptha Wilkinson, Jr., nephew of Jeremiah Wilkinson, invented a machine for making weavers' steel reeds, by water power.

Gardner Wilkinson invented the rolling axletree in two parts, so useful on railroad curves, &c. He also made the mortising machine, and, I think, he and his brother made the pivot bridge, used on canals.

About 1794, my father built a rolling and slitting mill, at Pawtucket. On the gudgeon of the wheel of which, I put my new screw machine in operation, which was on the principle of the gage or sliding lathe now in every workshop almost throughout the world; the perfection of which consists in that most faithful agent gravity, making the joint, and that almighty-perfect number three, which is harmony itself. I was young when I learnt that principle. I had never seen my grandmother putting a chip under a three legged milking stool; but she always had to put a chip under a four legged table, to keep it steady. I cut screws of all dimensions by this machine, and did them perfectly.

I now made a model in miniature, and had thought of trying to procure a patent, but was afraid there might be something somewhere to interfere with me, already in use. So I started off to make inquiries. I went to New York, and found an Englishman, in Greenwich street, on North river, named Barton, making clothiers' screws. He was welding an iron guide on the end of his tap, and forcing it through a socket, with an iron bar, by hand, which was the old imperfection that troubled me always. I could hear of no other in New York. I had heard of one in Canaan, in Connecticut. I went on board a sloop, Old Captain Wicks, of Long Island, master, bound for Albany. In five days, I landed at Fishkill, and went ashore, and walked some thirty miles, to Canaan. I found screws made there by Forbes & Adams, by water power, but they welded on, and forced through a socket in the old way. I heard of screws being made in Canaan, from Abram Burt, of Taunton, Massachusetts. He called at Pawtucket, and looking at the old machine I was at work with by horse power, said he had been making screws, at Canaan, by water power; that he could "set his cutter in the socket, draw the gate, and then it lathered away like the devil," which I fully believed when I saw the machine. I returned to New York, and from there went to Philadelphia, and found no screws made there except after the same mode as in New York. I heard of screws being made on the Brandywine, but my informant assured me that they were made the same way as his and Barton's, at New York. I now returned home, and in the year 1797, went again to Philadelphia, when Congress was in session, and made application for a patent; Mr. Joseph Tillinghast, then a Senator from Rhode Island, assisting me. On my return home, my father informed me that Jacob Perkins had been there and wanted to see my machine, and that, when he saw it, he laughed out, and remarked that he could do his engraving on cast steel, for bank note plates, with that machine—that he could make a hair stroke with that, for it would never tremble—that he could put an oval under the end of the rut, and, with an eccentric, make all his oval figures. I suppose Mr. Perkins afterward derived great benefit from the thing.

Whilst I was at work on Slater's machinery, the owners were unwilling that I should make a slide lathe, on the principle of my screw machine, which was made for large turning; it was too heavy for cotton machinery. Mr. Slater said he had heard of one being made in England since he left, which would turn rollers. He wrote to Derbyshire, to his brother, John Slater, to come over, and bring a man who could build one. John came, and brought a Mr. John Blackburn, who made a slide lathe, which was on the principle of the old fluting machine, with the slide rest grooved in, in four edges, or two-edged bars, forced in toward each other, by wedges, in mortises, behind the tenon. They worked this lathe some few weeks, and then threw it out of doors, and afterward did their work by the old hand tool, as before.

About that time, my father, brothers, brothers-in-law William Wilkinson and Timothy Greene, and James, William, and Christopher Rhodes, purchased a water power on the Quinnebaug river, Connecticut, at Pomfret, and commenced building a cotton factory. These owners consented that I might build a gage lathe, like my large one. I then went to work, and made my patterns in Sylvanus Brown's shop in Pawtucket. I left out the three friction rollers from under the rut, as for light work and slow motion I was willing to risk the friction.

About this time, a Company in Providence got a master machinist from England, named Samuel Ogden, to build a factory at Hope furnace. He was a man of great experience and good abilities. He advised me as a friend to abandon my new machine, for said he, "you can *ner* do it, for we have tried it out at *ome*, and given it up; and don't you think we should have been doing it at *ome*, if it could have been done!"

Mr. Pitkin, of East Hartford, had an Englishman, named Warburton, with him, building a factory. Warburton told me, "they would never make our work in Europe—that Watt & Bolton gave it to a man for a month's work to finish a piston rod, with hand tools."

When I had finished my patterns for the lathe, and was already to start next morning, for the furnace, in Foxborough, Sylvanus Brown took it into his head to put them into the stove, and burn them up. I made others then, and got them cast, and made my lathe, and it worked to a charm. Mr. Richard Anthony, who was building a factory, in Coventry, with his brother William, paid me ten dollars for the use of my lathe patterns, to cast after. And this is all I ever received for so valuable an invention.

Captain Benjamin Walcott, father of the Walcotts at York Mills, Oneida county, New York, and of Edward Walcott, of Pawtucket, with Nathan J. Sweetland, put the "live center" arbor, and the rack, in place of the screw for the feeder, to a lathe they built afterward. But, on long experience, the screw is found the best, and the two "dead centers" will make the truest work—though they are not quite so convenient perhaps as the "live center" arbor. But the two great principles of my machine can never be improved upon—that is, three bearings to the rest, and weight to hold it down, where you may weigh your friction to an ounce.

The slide lathe has been sent to all parts of the world. A certain mechanic commenced business in this country, but after using one of my slide lathes a while, he bought one, and returned to England with it; remarking, that with that lathe in England,

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he could do better than at any business he could get into in this country.

It was unfortunate for me patenting my machine, when the machine-making and manufacturing business in this country was only in its infancy. The patent would run out before it could be brought into very extensive use. It certainly did run out without my deriving that benefit from the invention I was so justly entitled to. One solitary ten-dollar note is surely but small recompense for an improvement that is worth all the other tools in use, in any workshop in the world, for finishing brass and iron work.

The weighted slide, the joint made by gravity, applies to planing, turning and boring of metals of every kind, and every way, as it needs no watching, and, instead of wearing out of repair, it is always wearing into repair.

I was always too much engaged in various business to look after and make profit out of my inventions. Other people, I hope, gained something by them.

We built machinery to go to almost every part of the country—to Pomfret and Killingly, Connecticut; to Hartford, Vermont; to Waltham, Norton, Raynham, Plymouth, Halifax, Plymton, Middleboro, and other places in Massachusetts; for Wall & Wells, Trenton, New Jersey; for Union & Gray, on the Patapsco; for the Warren factories, on the Gunpowder, near Baltimore; to Tarboro' and Martinburgh, North Carolina; to two factories in Georgia; to Louisiana; to Pittsburgh; to Delaware; to Virginia and other places. Indeed, Pawtucket was doing something for almost every part of the Union, and I had my hands too full of business, and was laboring too much for the general prosperity, to take proper care of the details, perhaps, and the advancement of my own individual interests.

In 1829, we all broke down; and although I was sixty years of age, and in very bad health, I thought I would move away, and see if I could not earn my own living. I moved with my family to Cohoes Falls, in the State of New York, and there fixed my new home. I have since recovered my health wonderfully, and, at this moment, being about seventy-six years old, I am hearty and well—enjoy my food as well as any one, and can bear a good deal of fatigue and exposure. Few men, of my age, enjoy their faculties and health better than I do. Have I not much to be thankful for? I have, and am most sincerely thankful to a merciful God, for the many and great blessings.

These are the recollections of an old man, and you will please take them for what they are worth. If they are worth anything to any one, I shall be glad. To yourself, I believe, they will be valuable, and be the means of recalling many pleasant incidents of olden times, and of an old friend.

DAVID WILKINSON.

Cohoes, Albany County, N. Y., Dec. 1, 1846.

Rev. GEORGE TAFT, Pawtucket, R. I.

Revival of an Expired British Patent.

The revised English patent law of 1852 requires the patent fees to be paid in three installments. The first on application for the patent, the second at the end of three years, and the third at the end of seven years. If either the second or third installments are neglected to be paid, the patent is held to have expired. In some cases this has been found to be a great grievance, owing to inadvertence in the mode of paying the installments. The British Parliament, however, has shown a disposition to sympathize with inventors in such cases, and recently a private act has been passed to legalize a patent that was held to have expired at the end of three years. This act is given as follows in *Newton's Journal* for July :—

Whereas, the non-payment of the said stamp duty, and the non-production of the said Letters Patent, duly stamped, within the time limited for that purpose, arose from inadvertence on the part of the person employed by the said Thomas Webb and James Craig, to take the necessary steps for payment of the said duty, and production of the said Letters Patent; and it is expedient that the said Letters Patent should, notwithstanding, be rendered valid in manner hereinafter mentioned; but the purposes aforesaid cannot be effected without the authority of Parliament. Be it enacted :—

1. That within one month after the passing of this Act, it shall be lawful for the said Thomas Webb and James Craig, their executors, administrators or assigns, to pay the said stamp duty of fifty pounds, and for the said Letters Patent (a true copy of which is set forth in the Schedule to this act) or a duplicate thereof, to be stamped with proper stamps, showing the payment of the said stamp duty, and to be produced at the office of the said Commissioners. and for the said Commissioners of Patents, or their clerk, to stamp the said Letters Patent, or a duplicate thereof, specifying the date of such production, and to endorse on the said Letters Patent, or duplicate thereof, a certificate of the production of the same duly stamped, and to endorse a like certificate upon the warrant for such Letters Prtent filed in the said office.

2. That the said Letters Patent, so stamped as aforesaid, shall be considered, deemed and taken to be, and to have been, as good, valid, and effectual, to all intents and purposes as if the said stamp duty of £50 had been paid, and the said Letters Patent stamped with a proper stamp duty, and to that amount, had been produced by the said Thomas Webb and James Craig, at the office of the Commissioners of Patents for inventions before the expiration of three years from the date of the said Letters Patent, as in the said Letters Patent provided.

3. Provided always, that no action or suit shall be commenced or prosecuted at law or in equity, nor any damage recovered for or in respect of any infringement of the said Letters Patent, which shall have taken place after the expiration of the said three years from the date of the said Letters Patent, and before the payment of the said fifty pounds, and the stamping of the said Letters Patent in pursuance of this act.

RECENT AMERICAN INVENTIONS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week. The claims may be found in the official list.

Seal Lock.—This lock, which may be called the "seal lock," is composed of a block of brass or other metal, constructed for the reception of a cord and seal, and containing a griper, whereby, when applied to a mail bag or other package, to secure the same by means of the cord, it prevents the package from being opened without either severing the cord or removing the seal, which, owing to the peculiar mode of its application within the block of metal, is protected against being accidentally broken. The objects of the invention are to provide for the easy detection of any tampering with the bags or packages, to dispense with the use of a key, and to obtain a lock which is not liable to be easily deranged in any way. The detection of any tampering is effected by observing the condition of the cord and seal on the arrival of the bag or package at its destination, the key being dispensed with by cutting the cord, and the lock being fit for use again after the removal of the cord and seal and the substitution of new ones. Jean Remy Boubilla, of Paris, France, is the inventor of this device.

Lamp Burner.—This invention relates to coal-oil lamp burners, and consists, first, in a novel and useful improvement in the wick tube, whereby much broader wicks than usual may be employed in burners of a given size, and a corresponding broader flame obtained. It consists, second, in a novel and improved means for elevating and lowering the wick, whereby it will not be compressed in the tubes as hitherto and the free ascent of the oil retarded, and, at the same time, the moving of the wick rendered certain, whether it be thick or thin for the tube, and capable of being moved or adjusted within the tube with the greatest facility. E. B. Requa, of Jersey City, N. J., is the inventor.

Clothes-Wringing Machine.—This invention relates to an improved clothes-wringing machine of that class in which pressure rollers are employed for expressing the moisture from the clothes. It consists in an improved means for adjusting the spring or pressure bar of the upper or yielding roller, whereby the machine may be adapted with the greatest facility for operating upon fine or heavy clothes, as may be required. It also consists in an improvement in the construction of the rollers, whereby the india rubber which forms the covering of the same may be permanently secured in proper position without the liability of turning on the shaft or slipping longitudinally thereon. The invention further consists in a novel and improved means for securing the machine to the wash tub, whereby a firm attachment is obtained by an exceedingly simple arrangement. S. P. Rowell, of Melrose, Mass., is the inventor.

THE Pittsburgh *Chronicle* states that on July 1st 300 barrels of petroleum were barreled up by J. Cornwall, Esq., at his wells on Oil Creek, and delivered to Messrs. Reese & Graff, at the Petrolite Oil Works, Pittsburgh, on the 5th. Twelve thousand gallons of it were charged into Reese's Patent Mammoth Still on the same day. It was distilled on the 7th, deodorized on the 8th, and shipped to New York on the 9th. This, the *Chronicle* thinks, is the quickest work of the kind ever heard of.

ISSUED FROM THE UNITED STATES PATENT OFFICE.

FOR THE WEEK ENDING JULY 15, 1862.

Reported Officially for the Scientific American.

*** Pamphlets giving full particulars of the mode of applying for patents, under the new law which went into force March 2, 1861, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

35,864.—Anthony B. Allen, of New York City, for Improvement in Corn Shellers :

I claim the metallic standard piece, A, constituting one side of the hopper, bearing for spur wheel, C, and for the beveled balance wheel, also constituting a support for holding spring, I, by means of the flanges, a8 and a9, whether said standard be made in one or more pieces, substantially in the manner and for the purpose set forth.

35,865.—Joseph Battin, of Newark, N. J., for Improvement in Steam Generator :

I claim the steam generator, when constructed and fed, substantially in the manner and for the purpose herein above specified.

35,866.—E. S. Blake, of Pittsburgh, Pa., for Improvement in Lamp Chimneys :

I claim, first, The mode herein described of constructing lamp chimneys ; that is to say, making the shaft in whole or in part of several pieces of flat glass, arranged as herein described.

I also claim the base constructed to receive the lower ends of flat plates of glass, for the purposes above set forth ; and

I claim the metallic top, when the same is provided with a base or plate, adapted to receive or form a joint with the upper ends of flat plates of glass, and is designed to be used in combination with such plates, in the manner and for the purposes herein set forth.

Second, I claim a shield for the top of the shaft of a lamp chimney, for the purpose of preventing the extinguishment of the flame by currents of air, as herein described.

35,867.—Harris Boardman, of Lancaster, Pa., for Improvement in Cork-Cutting Machines :

I claim the combined arrangement of the cutter, as described, sliding tool, stock operated by a treadle, adjustable stop, E, long traverse pulley, P, and adjustable, stationary rod, R, substantially as and for the purposes herein specified.

35,868.—Jean Remy Boubilla, of Paris, France, for Improvement in Seal Locks for Mail Bags :

I claim the seal lock, composed of the block, A, with its passages a and b, seal cavity, c, and griper, e e, substantially as herein specified.

35,869.—Nason Burnham, of Norwalk, Ohio, for Improvement in Spring Balances :

I claim, as a new article of manufacture, a spring balance, in which a volute spring (of the form represented in the drawings) is employed, substantially in the manner herein set forth.

35,870.—John W. Crannell, of Springport Township, Mich., for Improvement in Axles for Vehicles :

I claim connecting an iron axle with a wooden axletree, by the use of the shank, J, and collar, I, in combination with the shoe, B, lock nut, m, and washer, O, substantially as and for the purposes described.

35,871.—George H. Dodge, of Camden, N. J., for Improved Steam Gage :

I claim, first, The two springs, H and H', attached to the arms, B and B', or their equivalents constructed, applied to the spindle of the pointer, and operating substantially as herein before described.

Second, I claim the cam, G, on the spindle of the pointer, in combination with the springs, H and H', and the arms, B and B', or their equivalents ; the whole being arranged and operating as and for the purpose herein set forth.

35,872.—W. H. Elliot, of Plattsburgh, N. Y., for Improvement in Patched Cartridges :

I claim the combination, in one cartridge, of the shell, ball, patch powder and fulminator, as an article of manufacture and trade.

35,873.—Michael Galvin, of Wilkesbarre, Pa., for Improvement in Hand-Tenoning Machines :

I claim the adjustable bottom, i, arranged to be operated substantially as shown, when used in combination with the box, A, and plane, C, all arranged as and for the purpose specified.

[This invention relates to an improved machine for cutting tenons by hand, and is designed chiefly for cutting tenons on door rails and similar work. The object of the invention is to obtain a simple and efficient device for the work bench, which will greatly facilitate the cutting of tenons by the manuel process.]

35,874.—L. S. Graves, of Rochester, N. Y., for Improved Dies for Cutting Beveled Soles for Boots and Shoes :

I claim the die, A, having the edge of its w[illegible] beveled on the inside, at b, and having the cutting edge, c, outside [illegible] said bevel, so that the die will cut a beveled sole on a plane surface, substantially as herein set forth.

35,875.—G. W. Harrold, of Rochester, N. Y., for Improvement in Fountain Lamps :

I claim the induction of illuminating fluid into a transparent fountain lamp, substantially as and for the purposes aforesaid.

35,876.—John Hoeniger, of New York City, for Improved Machine for Amalgamating Gold and Silver :

I claim the herein-described machine for amalgamating and separating gold and other precious metals from their ores, consisting of the vessel, A, the disk, B, in combination with the projecting plates, a a, all substantially as set forth and described.

35,877.—Joseph Hursh, of Philadelphia, Pa., for Improvement in Arranging Water Tubes for Cooling the Breech of Ordnance :

I claim constructing the barrel, with a series of straight tubes, arranged substantially as described, in relation to the barrel and to the jacket which is cast around it, the tubes being connected with the chambers, E and G, or their equivalents.

I also claim arranging the sighting tube, J, in one of the cooling tubes, substantially as described and for the purpose set forth.

35,878.—Henry Kellogg, of New Haven, Conn., for Improvement in Metallic Cartridges :

I claim constructing a water-proof metallic cartridge, having the ball, powder and case combined, without fulminate or percussion powder, as herein described, by making in the rear or closed end, and of one and the same piece of the cartridge case, a projecting nipple, said nipple to be removed by cutting it away, at or before the instant of discharge, in the manner and for the purpose substantially as herein set forth.

35,879.—H. J. Lombaert, of Philadelphia, Pa., for Improved Mode of Constructing and Applying Rails to Railroads :

I claim, first, A compound rail, for railroads, consisting of the two parts, A and B, the intermediating blocks or plates, C, and the clamping hooks, D D', the same being arranged and combined together in relation to each other and to the positions of the supporting cross ties or ground sills, substantially as described and set forth, for the purposes specified.

Second, I claim securing the joint which occurs at the abutting or

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contiguous ends of the wearing rails, A, by means of an intermediating plate, C2, arranged midway between the adjacent cross ties or ground sills, and directly beneath the said joint; the said plate being rigidly clamped between the rail, B, and the ends of the rails, A; all substantially in the manner described and set forth.

Third, I claim making the supporting rail, B, to have the nearly vertical planes, b5 b5, along its recessed sides, and the beveled edges, b2 b2, projecting therefrom, substantially as described and set forth, for the purposes specified.

Fourth, I also claim making the said supporting rail, B, to have the central series of both holes, b3, arranged at the equal distances apart described and set forth, for the purpose specified.

Fifth, And I also claim making the said supporting rail, B, to have the series of protuberances, b′, or their equivalents, arranged at the equal distances apart described, and also in the relation to the bolt holes, b3, described for the purposes specified.

35,880.—A. J. Low, of German Township, Pa., for Improved Portable Apparatus for Evaporating Saccharine Juices:

I claim, first, The receiver, K, inclined plane, J, in combination with the trough, e, strainer, g, and pipe, f, when arranged to operate in the manner and for the purpose set forth.

Second, The screw, F, winch, H, and swiveled foot, G, in combination with the evaporating pan, I, and wheels, B B, when arranged to operate in the manner specified.

[This invention consists in an arrangement of devices, whereby the process of removing the scum from the surface of the liquor, is greatly facilitated. Also, in a peculiar device for varying the inclination of the evaporating pan, to accelerate or retard the flow of liquor through the several compartments thereof. An engraving of this invention will soon appear in this paper.]

35,881.—Michael Madden, of St. Louis, Mo., for Improvement in Retainers for Hydraulic Presses:

I claim the toggle rods, C C, when the same are used in combination with the movable top, B, and movable keys, F F, as set forth in the specification and shown in the drawing.

35,882.—G. T. May, of Tompkinsville, N. Y., for Improved Masts and Rigging:

I claim the use, in combination with the lower mast, a, the pivot mast, b, the bridge with hounds and clamps, c, and the lower rigging, d and e, of the following named specified parts:—the upper mast, f, the top-mast forward stays, g, the top mast back stays, h, the top-mast breast rigging, i, the forward-out riggers, j j′, the back-out riggers, k k′, the collar, l, the ridge lines, D′ D″ D‴ D⁗ D⁗′, the top-gallant forward stays m, the top-gallant back stays, n, and the top-gallant breast shrouds, o′, substantially as described and for the purpose set forth.

I claim, also, in combination with the above, the gaff top sail jack stay, s, the bull's eye, D, the guess rope, F F, the thimble, M, the lanyards, I, and the rings, J, substantially as and for the purpose set forth.

I claim, also, in combination with all the above, the mast rope, p, the mast downhaul, q, and the step, r, substantially as and for the purpose specified.

35,883.—W. H. McNary, of Brooklyn, N. Y., for Improvement in Converting Motion:

I claim the employment, in combination with a switch wheel, or other equivalent device carried by a driving shaft, of a gear, B, and toothed wheel, I, the said gear carrying pins, G G, controlled by springs, and the said toothed wheel being furnished with wedges, s s, or other inclined surfaces of similar character, and the said gear and toothed wheel being connected by a pinion, J, or its equivalent, actuated by a fixed tooth, t, the whole combined and applied to operate upon the reversing lever, E, or other device for reversing the motion, substantially as herein specified.

[This invention consists in certain means, applied in combination with a driving shaft, rotating continuously in one direction, whereby the said shaft may be made to impart rotary motion to machinery, either in one direction or the other, and to reverse the direction automatically, at such intervals of time, however irregular, as may be desired.]

35,884.—James Millholland, of Reading, Pa., for Improvements in Apparatus for Casting Ordnance:

I claim, first, So constructing the upper end of the tube, D, in respect to the gearing, for driving the same, that the said tube can expand and contract, without any interruption of its rotary movement.

Secondly, Combining the aforesaid tube, D, and its hollow base, with the water-tight casing, A, substantially as and for the purpose herein set forth.

35,885.—G. H. Mills and J. M. Hanscom, of Boston, Mass., for Improvement in Hammers:

We claim a hammer provided with a taper groove, C, at its side, to receive and hold a nail, for the purpose of sticking the same, without the aid of the fingers, preparatory to driving it, as herein set forth.

[This invention relates to a simple means for securing a nail to the head of a hammer, so that the nail may be "stuck," as it is technically termed, into the wood, preparatory to driving it.]

35,886.—E. R. Morrison, of New York City, for Improvement in Automatic Apparatus for Walking Figures:

I claim, first, The double eccentric cam joints, c e, in combination with the levers, B C, which give alternate reciprocating movements to the pedal extremities for walking figures, in the manner as and for the purposes specified.

Second, I claim the automatic stepping movement, consisting of the shaft, D, the cams, c e, pin, i, vertical levers, B C, and foot, A, in combination with clockwork, substantially as and for the purpose herein described,

35,887.—M. D. Myers, of Ilion, N. Y., for Improvement in Hay Elevators:

I claim, first, Arranging the tripping cord and bolt in relation to the tongue and head, as and for the purpose herein set forth.

Second, The employment of pulleys, i, in combination with cord, f, when the cord passes through a head which turns upon its axis when the hay is discharged, as and for the purpose specified.

35,888.—George Palmer, of Littlestown, Pa., for improvement in Pumps:

I claim the internal arrangement, consisting of the enlarged cavities or water space above the valves, in combination with the buoy or float, H, acting upon the plunger, E, the stationary cap valve, x y z, the adjustable toggle joint, m, connecting with the pump handle, L, and the bumper, r, all constructed and arranged, substantially in the manner herein specified.

35,889.—W. R. Peavey and H. M. Peavey, of Swanville, Maine., for Improvement in Hay Press:

We claim the arrangement and combination of the windlass, G, the two leading ropes, F′ F′, the two scroll wheels, E E′, their shafts, D D′, the grooved cone pulleys, C C C′ C′, and the platen-supporting ropes, b b b b, as set forth, the whole being for the purpose of operating the platen, as explained.

We also claim combining the windlass with the press box, by means of the foot strut and the two braces, arranged as specified.

35,890.—S. T. W. Potter, of Scott, N. Y., for Improved Subsoil Plow:

I claim the inclined curved mold board and share, provided with the ledge or guard, arranged substantially as and for the purpose hereshown and described.

[This invention consists in constructing the mold board of the plow in the form of a curved inclined plane, with a guard at its land side edge, whereby the plow, as it is drawn along in the furrow previously made by a surface plow, will take up the subsoil and deposit it on the furrow slice turned by the surface plow, so that the field when plowed will have the subsoil brought to the surface for subsequent tillage.]

35,891.—George Race, of Norwich, N. Y., for Improvement in Water Elevators:

I claim, first, A hollow crank having a ratchet wheel permanently attached thereto, as described.

Second, The loose friction band or clutch having projections and stops, substantially as set forth and operated by means of a ratchet lever.

Third, The ratchet lever, constructed as described and operated by means of the pinion, S, or its equivalent, and arranged with reference to the spring, D, and thumb screw, F, as described.

35,892.—B. H. Reece, of Marion, Iowa, for Improvement in Beehives:

I claim, first, Supporting or hanging the movable frames, a a a, by means of dove tails, in order that they may be easily and expeditiously removed without irritating the bees, substantially in the manner set forth.

Second, The moth slide, d, when employed in conjunction with frames, a a a, and movable glass door, b, the whole being constructed and arranged in the manner and for the purpose specified.

35,893.—E. B. Requa, of Jersey City, N. J., for Improvement in Lamp Burners:

I claim, first, Bending or curving the lower part of the wick tube, B, in semicircular form in its horizontal section, as and for the purpose set forth.

Second, Operating or raising and lowering the wick, k, through the medium of the crank shaft, E, fork, G, and rod, F, provided with the spring, l, substantially as described.

35,894.—James Richmond, of Lockport, N. Y., for Improvement in Machines for Dressing Mill Stones:

I claim the guide bed, B, with plane parallel surfaces, h h, and provided with a slot, L, in combination with the adjustable diamond shank, M, and its slide, N, arranged and operating substantially as and for the purpose herein described.

I also claim the guide bed, B, connected with the stationary platform, A, by means of the screw, C, or its equivalent, operated by means of the nut, E, and lever, I, provided with a pawl, b, or their equivalents, and gaged by means of the adjustable pins, d d, arranged and operating substantially as and for the purposes herein set forth.

35,895.—William Rumbold, of St. Louis, Mo., for Improved Construction of the Defensive Armor of Ships:

I claim, first, So forming and arranging relatively to one another metal beams, A C, that the force of a cannon ball or other force is transmitted in an indirect line from the point of contact, substantially in manner and for the purpose set forth.

Second, The combination of the beams, A C, and tie bands, E E, the whole constructed and applied together, substantially in the manner and for the purpose described.

35,896.—G. S. Rust, of Chester, Ill., for Improvement in Expressing the Juice of Apples, Grapes, &c:

I claim expressing and separating juices, oils and fluids from the substances which contain the same, by employing in an organization, substantially as described, a pressing cylinder whose periphery is perforated or constructed of open work, and whose body is hollow, substantially as and for the purposes set forth.

35,897.—J. P. Schenkl, of Boston, Mass., for Improvement in Time and Concussion Fuses for Shells:

I claim a rotary fuse having its covering or case, whether made of paper or other suitable material, provided with a series of holes so arranged that each by a suitable movement of the fuse case may be brought into conjunction with some one of another series of holes made in the fuse plug; the requisite motion of the fuse within its plug being effected by a fuse rotator, and the fuse being provided with an igniting apparatus, all substantially as specified.

I also claim the combination of the wrench pin, E, with the percussion striker, the rotator and its latch spring.

I also claim the combination of one or more vent holes, o o, and a closing annulus, n, or its equivalent, with the rotary fuse holder and fuse when combined with the rotator, and a percussion apparatus, substantially as described.

I also claim the arrangement of the perforations in the rotary fuse and its holder, viz., in two semihelices or parts of helices pitched in opposite directions in the fuse and its holder, substantially as explained.

I also claim a rotary fuse and its holder, made with perforations, r s, arranged as described, and also with a scale and index so applied as to enable the fuse to be adjusted so as to bring any one of its holes of its range, s, to open into a hole of the range, r, of the fuse holder.

I also claim the combination of the latching apparatus, u, and the series of recesses, t t, with the scale of the holder, B, when said holder is combined with a rotary fuse, and both are provided with ranges of holes, as specified.

35,898.—J. R. and J. A. Shepard, of Waukegan, Ill., for Improved Window Clothes Dryer:

We claim, first, The employment or use of a revolving clothes dryer or reel, B, when the same is secured to a window, C, substantially in the manner and for the purpose shown and described.

Second, The arrangement of the V-shaped support, A, and looped wire, d, in combination with the reel, B, as and for the purpose specified.

Third, The sliding carriage, D, in combination with the support, A, and reel, B, constructed and operating substantially as shown and described.

Fourth, The latch j, arranged in combination with the slotted plate, i, raised part, j′, and pivot, g′, of the rack, B, substantially in the manner and for the purpose set forth.

[This invention consists in the employment of a revolving reel, suspended from a slide that rests on a V-shaped support, extending in a horizontal direction from the window for the purpose of drying clothes, said reel being so arranged, that its arms can be turned one on the top of the other, when the reel is not used, and that by turning them out in a position at right angles to each other, they are locked and retained in their position.]

35,899.—Darius Skidmore, of Seneca Falls, N. Y., for Improved Mode of Fastening Door Knobs to their Spindles:

I claim the sleeve, D, provided with a hole, d, either forming a part of or detached from the rose, E, when the same is used in connection with the shank, B, for holding the coupling pin in place, arranged substantially as herein described.

35,900.—J. J. Speed, of Gorham, Maine, and F. B. Smith, of Brooklyn, N. Y., for Improvement in Treating Ardent Spirits:

We claim the use and forcing of atmospheric air, hot or cold, into and through ardent spirits, and also in combination with said process, the arresting in water, and saving for use the alcohol which combines with the air, in the manner and by the combination of apparatus, substantially as described above.

35,901.—J. W. Street, of Salem, Ohio, for Improvement in Harvesters:

I claim, first, The lever, E, elastic or otherwise, fulcrumed upon the shaft, C, and projecting on each side of the box, D, for the purpose of throwing the pawls, d d, in and out of gear, substantially as explained.

Second, Mounting the two independently and separately cast intermediate gear wheels, G and G′, upon a common sleeve, g, which sleeve is journaled upon the shaft, H, which hinges the drag frame to the main frame, A.

Third, The drag frame, I I′ I″ J J′, constructed and employed in the manner and for the purposes described.

Fourth, Attaching the finger bar by a diagonal hinge, l′, on either a perpendicular or horizontal side of the drag frame, shoe or finger bar, with or without the horizontal hinge, l, to admit of folding the bar for transportation, substantially as described.

[In this machine, the draft is very materially reduced, by an improved manner of communicating motion from the driving wheels to the cutting mechanism. The machine is found to work with good effect under some conditions of the crop in which other machines are inoperative. A new form of joint is also employed, giving great flexibility to the bar, and adding to the portability of the machines.]

35,902.—B. F. Sturtevant, of Boston, Mass., for Improved Preparation of Shoe Pegs:

I claim as a new manufacture, shoe nails or pegs and paper, or its equivalent, arranged and combined, substantially in manner and for the purpose as set forth.

35,903.—P. C. Van Brocklin, of Buffulo, N. Y., for Improvement in Converting Rotary into Reciprocating Motion:

First, The toothed wheels, A and B, so arranged as to revolve in opposite directions, and act directly upon the part to be reciprocated, without the intermediate use of connecting rod or levers, substantially as herein set forth.

Second, The combination of the spring, K, with said toothed wheels and reciprocating bar, for the purposes and substantially as described.

35,904.—Thomas Varney, of San Francisco, Cal., for Improved Amalgamatory Machine for Gold and Silver:

I claim the two plates, A C, fitted in the pan or chamber, B, provided respectively with grooves, a d, and used in connection with the cap, H, provided with the feed and discharge spouts, I J, and flanch, f, all arranged to operate with ore pulp under pressure, substantially as and for the purpose set forth.

35,905.—G. W. Walker, of Boston, Mass., for Improvement in Cooking Stoves:

I claim my improved range or stove, having its fire box, B, its oven, I I, flue, R, hot air chamber, N, induction flue, M, eduction flue, O, and register, L, constructed and arranged in relation to each other, and to operate in manner as set forth.

I also claim the flue, R, as made to extend around the top, the bottom and the two ends of the oven, and also a portion, S, of the rear part thereof, the same being as and for the purpose specified.

I also claim the application or arrangement of a register or register plate, L, to one or both spaces between the fire box and the flue, R, in manner and for the purpose set forth.

35,906.—J. M. Whiting, of Providence, R. I., for Improvement in Machines for Shaving and Nicking the Heads of Wood Screws:

I claim, fist, The combination and arrangement of the sliding sleeves, S S, the toggle joint, s s s, the plunger, d, cam, f, substantially as described for the purpose specified.

Second, I claim the sliding bars, h h, in combination with the fixed posts, 4 4, for operating the back rests, e e, substantially as specified.

Third, I claim the employment of the toggle joint, s s s, for the twofold purpose of operating the jaws of the nippers, which seize and hold the blank to be operated upon, and for operating the back rests, e e, which support the blanks therein while being operated upon, substantially as specified.

Fourth, I claim the combination and arrangement of the toggle joint, y y y, the plunger, x, the lever, q, the cam, z, and the spring, P4, substantially as described for the purpose specified.

Fifth, I claim the combination and arrangement of the friction clutch, D2, the pulley, H2, the shifting levers, N, and the spindles, A A, with a suitable belt or band for communicating motion to the said spindles, the same operating substantially as described for the purpose specified.

Sixth, I claim the combination and arrangement of the pin, x2, the lever, v2, the sliding piston actuated by the spring, P2, and their connections, the latch, t, the catch, z1, and the fixed post, f3, for inserting the blank in the jaws of the nippers simultaneously with its arrival in the proper position to be received by said jaws, substantially as specified, and in combination therewith the finger, V2, and the stud, d3, upon the sliding piston for the purpose of placing the pin, x2, in the proper position to operate upon the succeeding blank, substantially as specified.

Seventh, I claim the combination and arrangement of the railway, F′, constructed and arranged as described, the revolving cylinder, K′, the flat springs, m2 m2, and the barrel, a2, for the purpose specified, in connection with a suitable device for inserting the blanks in the jaws of the nippers, substantially as specified.

Eighth, I claim the tumbler, R, arranged and operating in connection with the railway, F′, substantially as specified.

35,907.—Richard Yeilding, Ypsilanti, Mich., for Improvement in Corn Harvesters:

I claim, first, The combination of the reciprocating sliding bars, E, and pivoted arms, X, with the pivoted arms, W, and rotating knives, J K, arranged to operate in the manner and for the purpose set forth.

Second, The sliding bars, A A′, pinions, i o, rack, C, pitman, n, and hand lever, D, when combined and arranged to operate in the manner and for the purpose set forth.

[This invention consists in a peculiar device for gathering and holding the tops of the stalks, while the rotating knives cut them off near the ground. It also consists in the use of two sliding bars for supporting the cut stalks, until a sufficient quantity has been harvested to form a suitable sized gavel, and then by a simple movement of said bars, imported to them by means of a hand lever within the reach of the driver, depositing the gavels on the ground in parallel rows, convenient for loading into a wagon for transportation.]

35,908.—Alexander Douglas, of English Neighborhood, N. J., assignor to self and S. S. Sherwood, of Acquackanonck, N. J., for Improvement in Store Trucks:

I claim the combination with the store truck of the break bars, 7, or its equivalent, by which the rotation of the wheels is prevented at the time of loading the truck, when the said break bar is so arranged in relation to the other parts of the truck as to be easily accessible to the foot of the operator, substantially as herein set forth.

35,909.—J. H. Garel (assignor to self and J. B. Thompson), of Philadelphia, Pa., for Improvement in City Railway Tracks:

I claim the combination of the rails, A, with the wheels, B, when constructed respectively with planes, a b, and treads formed of two surfaces, c d, substantially as and for the purpose herein set forth.

[This invention consists in constructing the rails of such a form that they will, when laid and adjusted in proper position for use, offer no obstruction to ordinary wheel vehicles in crossing them, and at the same time admit of fire engine hose being laid across them, without the same being liable to be cut and injured by the passage of the wheels over them.]

35,910.—S. P. Rowell, of Melrose, Mass., assignor to himself and A. Chipman, of Boston, Mass., for Improved Clothes Wringer:

I claim, first, The cam, F, provided with a plurality of sides, 1 2 and 3, at different distances from the fulcrum pin, d, of the lever, G, to which the cam is detached, in combination with the bar, D, and pressure rollers, B B′, and with or without the spring, E, all arranged for joint operation as and for the purpose herein set forth.

Second, Constructing the rollers, B B′, of wooden segments, g, applied to the shafts, f, covered with cloth, h, secured by the bands, i, and covered with the rubber tube, H, substantially as described.

35,911.—G. P. Towle (assignor to self and R. H. Spaulding), of Boston, Mass., for Improved Clothes Wringer:

I claim the arrangement and combination, in a clothes wringer or presser, as shown and described, of the yielding surfaced roll, C, the bearing pins, e, the wooden spring, f, the link, h, and the cam lever, g, all operating together as set forth.

35,912.—Lucius Woodruff (assignor to the Russel and Erwin Manufacturing Company), of New Britain, Conn., for Improvement in Locks:

I claim the parallel arms, e′ e′, of the latch or catch bolt, C, placed out of line with each other or in different planes, in combination with the lugs, h h, of the hub, D, also placed out of line with each other or in different planes, and arranged relatively with the arms, e′ e′, and projections, g g, thereof to admit of the reversing of the latch or catch bolt, C, in the case, A, for the purpose specified.

[This invention relates to an improved lock of that class which are provided with reversible latch or catch bolts, to admit of the lock being applied to either a right or left-hand door, without the necessity of inverting the former. The object of the invention is to obtain a reversible bolt which will not enhance the cost of construction above that of an ordinary lock, and at the same time not increase the thickness of the lock or render it necessary to vary the usual porportions of the same in any degree, and also admit of being readily adjusted to suit the door to which the lock is to be applied.]

35,913.—J. A. Hotchkiss, of Pleasant Township, Indiana, for Improvement in Hay and Cotton Press, &c.:

I claim, first, The combination of the bar, L, passing through slots or their equivalents, in the end of the chest with the levers, G G, and arms, H H, operating the ram or follower, F, substantially as described.

Second, Actuating the levers, G G, by the shaft, I, through the instrumentality of the roller, K and K′, substantially in the manner set forth.

Third, Actuating the follower, F, as a ram or pounder by means of the shaft, I, and drum, c, substantially as and for the purpose set forth.

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PATENTS FOR SEVENTEEN YEARS.

The new Patent Laws enacted by Congress on the 2d of March, 1861, are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The duration of patents granted under the new act is prolonged to SEVENTEEN years, and the government fee required on filing an application for a patent is reduced from **$30** down to **$15**. Other changes in the fees are also made as follows :—

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The law abolishes discrimination in fees required of foreigners, excepting reference to such countries as discriminate against citizens of the United States—thus allowing English, French, Belgian, Austrian Russian, Spanish, and all other foreigners except the Canadians, to enjoy all the privileges of our patent system (except in cases of designs) on the above terms.

During the last sixteen years, the business of procuring Patents for new inventions in the United States and all foreign countries has been conducted by Messrs. MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN ; and as an evidence of the confidence reposed in our Agency by the Inventors throughout the country, we would state that we have acted as agents for more than FIFTEEN THOUSAND Inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of Inventors and Patentees at home and abroad. Thousands of Inventors for whom we have taken out Patents have addressed to us most flattering testimonials for the services we have rendered them, and the wealth which has inured to the Inventors whose Patents were secured through this Office, and afterward illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! We would state that we never had a more efficient corps of Draughtsmen and Specification Writers than are employed at present in our extensive Offices, and we are prepared to attend to Patent business of all kinds in the quickest time and on the most liberal terms.

The Examination of Inventions.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submitit to us, with a full description, for advice. The points of novelty are carefully examined, and a reply written corresponding with the facts, free of charge. Address MUNN & CO., No. 37 Park-row, New York.

Preliminary Examinations at the Patent Office.

The advice we render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there, but is an opinion based upon what knowledge we may acquire of a similar invention from the records in our Home Office. But for a fee of $5, accompanied with a model or drawing and description, we have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a Patent &c., made up and mailed to the Inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through our Branch Office, corner of F and Seventh-streets, Washington, by experienced and competent persons. More than 5,000 such examinations have been made through this office during the past three years. Address MUNN & CO., No. 37 Park-row, N. Y.

How to Make an Application for a Patent.

Every applicant for a Patent must furnish a model of his invention If susceptible of one; or if the invention is a chemical production, he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them, and sent, with the government fees by express. The express charge should be prepaid. Small models from a distance can often be sent cheaper by mail. The safest way to remi money is by draft on New York, payable to the order of Munn & Co. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents; but, if not convenient to do so, there is but little risk in sending bank bills by mail, having the letter registered by the postmaster. Address MUNN & Co., No. 37 Park-row, New York.

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Circulars of information concerning the proper course to be pursued in obtaining Patents in foreign countries through our Agency, the requirements of different Patent Offices, &c., may be had gratis upon application at our principe office, No. 37 Park-row, New York, or either of our Branch Offices.

Rejected Applications.

We are prepared to undertake the investigation and prosecution of rejected cases, on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted are invited to correspond with us on the subject, giving a brief history of the case, inclosing the official letters, &c.

Assignments of Patents.

The assignment of Patents, and agreements between Patentees and manufacturers, carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park-row, New York.

It would require many columns to detail all the ways in which the Inventor or Patentee may be served at our offices. We cordially invite all who have anything to do with Patent property or inventions to call at our extensive offices, No. 37 Park-row, New York, where any questions regarding the rights of Patentees, will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid), should be addressed to MUNN & CO., No. 37 Park-row, New York.

Notes and Queries

J. N. B., of Pa.—Your inquiry in regard to another person's business is not proper, and we cannot answer it.

R. E. G., of N. Y.—Any patentee, whose patent was issued previous to March 1, 1861, is not barred from obtaining an extension of his patent for seven years. No legal statute can be made retroactive.

H. G. D., of Mo.—Some ten years ago, quite an excitement raged in the whaling districts about shooting harpoons. On page 9, Vol. VI. (old series) SCIENTIFIC AMERICAN (1850), you will find illustrations of Albertson's plan for shooting whales, which you will perceive is not unlike yours.

S. G., of Mass.—In Vol. V. (old series) SCIENTIFIC AMERICAN (1850), you will find an illustrated description of Paine's apparatus for producing water gas. A number of articles on the subject appear in the same volume. It was thought to be the great discovery of the age at that time.

T. C., of Md.—Mr. Hansbrow's pumps are manufactured by him in Sacramento, Cal. He resides at the latter place when at home, but is now attending the Great Exhibition in London.

E. N., of Ohio.—A body within the cavity of a hollow sphere is attracted equally in all directions by the gravitation of the walls of the sphere, in whatever part of the cavity the body is situated. Consequently, a ball falling in a hole through the diameter of the earth, would have its motion accelerated at any time during its descent by the attraction of that portion of the earth which formed a sphere around the center, with the circumference of the sphere extending to the ball ; the attraction of the shell outside of this sphere having no tendency to move the ball.

R., of Mass.—It has been found in exploring expeditions where parties were subjected to great fatigue and exposure, that the educated persons of the party, though of slender frames, have endured the trial better than the apparently tougher laborers.

H. M. D., of Ohio.—In using superheated steam for distilling petroleum, it is scarcely possible to regulate the temperature if the superheating pipes pass through the furnace. They should be conveyed through the neck of the smoke stack. We believe there is no difference in the quality of refined Pennsylvania and Canada petroleum, but the latter is more difficult to deodorize. Some distillers prefer a high and others a moderately low retort, without the admission of steam into either.

C. D., of Mass.—With the aid of a good work on elementary drawing, and a set of proper instruments, you may become a tolerably good draftsman in a few years, without a teacher, if you are careful and dilligent. Every machinist should be able to draft machinery.

C. E. H., of Md.—You will find an illustrated essay on the cause and cure of the potato rot, on page 408, Vol. XIII. 1858, (old series) SCIENTIFIC AMERICAN.

I. B., of C. W.—The hames for horse harness are steamed to render them pliable, and are bent in a machine. You should see the operation in order to obtain a correct idea of the mode of performing it yourself.

I. K. W., of Wis.—A most excellent oil to preserve the locks of guns and bright iron from rusting, may be made as follows :—Take some refined petroleum and add about ten per cent, in measure, of castor oil and stir together well, and it is ready for use. This is also a good lubricating oil for machinery.

J. G., of Ill.—The Excelsior Gin, described on page 26 present volume SCIENTIFIC AMERICAN, is not used for ginning short staple upland cotton.

H. H. W., of Ohio.—The common tincture of iodine is superior to nitric, muriatic, or any of the common acids, for browning the barrels of rifles and shot guns. It should be applied with a clean rag to the polished metal, in several successive coats, until the gun barrel is properly oxidized.

R. O. W., of Vt.—You will find a description of the principles and practice of electro-plating and gilding, on page 361, Vol. V. (new series) SCIENTIFIC AMERICAN. The information is applicable to plating either with a magneto-electric machine or a Smee battery. Yellow ink may be made with a strong solution of the bichromate of potash ; green ink with a solution of verdigris, or with a mixture of neutral sulphate of indigo and the bichromate of potash. These are called permanent inks.

A. L. S., of R. I.—The largest steam cylinder that we know of afloat is on the *Metropolis*, which plies between this city and Fall River ; it is 105 inches in diameter, with 12 feet stroke. We believe there is a stationary cylinder in London 112 inches in diameter. The cylinders of Ericsson's air engine, on board the *Ericsson*, were 14 feet in diameter.

J. K., of Mich.—In removing the grease from wool, use a very weak alkaline solution as a substitute for soap, because if the solution is too streng it will act chemically upon the wool, tending to dissove it and thus injure its strength and luster. Wool may be completely dissolved, and formed into a soapy compound, by boiling it in a strong caustic soda lye.

H. W. T., of Pa.—Gum shell lac may be dissolved by boiling it in a strong solution of saleratus, and it thus makes a very good varnish, but it is easily washed off with water. For varnishing wood, lac should always be dissolved in alcohol.

J. B. L., of Ind.—Your plan for piercing the hull of an iron-plated ship below the armor by means of a shot with a chisel-shaped or beveled head fired from a smooth-bored gun, causing the shot to move in a curve through the water and thus come up under the bottom of the vessel, is novel and ingenious, but we should think impracticable. The resistance of the water would doubtless cause the shot to move in a curved track, but it would diminish the velocity and probably prevent the penetration.

C. R. B., of Kansas.—You should lubricate the stuffing box of the piston rod of your engine with oil and melted tallow. It is just as necessary to oil the stuffing box as the piston.

R. W., of N. Y.—In hardening thin articles of steel they should be dipped in warm instead of cold water when taken out of the fire, because they will not be so liable to bend and get out of shape. A temperature of 150° Fah., is about the right heat for the water.

J. F., of Pa.—The refraction of the sun's rays by the atmosphere of our earth has been very carefully investigated ; it would have very slight effect in increasing the heat at the surface of the earth. No water or gas can be drawn from the moon by the attraction of the earth.

W. M. T., of Ill.—The coal mines of America are all shallow compared with English mines. Some of the latter are nearly 2,000 feet deep; our deepest is not 500 feet.

Money Received

At the Scientific American Office on account of Patent Office business, from Wednesday, July 16 to Wednesday July 23. Persons having remitted money to this office will please to examine this list to see that their initials appear in it, and if they have not received an acknowledgment by mail, and their initials are not to be found in this list, they will please notify us immediately, and inform us the amount, and how it was sent, whether by mail or express.

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Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office from July 16 to Wednesday, July 23, 1862:—

J. W. B., of N. Y.; L. A. B., of Ill.; C. H. P., of N. Y.; G. U., of Mass.; S. & B., of Ind. (2 cases); J. N. E., of N. J.; A. J. H., of Pa.; G. & H., of Ind.; S. E. T., of N. J.; C. K., of Wis.; K. & H., of Wis.; S. & P., of Ill.; C. M. B., of Wis.; C. J., of Conn.; J. W. W., of Mich.; J. A., of Conn.; S. S. H., of Wis.; E. H. & K., of Iowa; J. G., of N. Y.; G. M. M., of Pa.; H. S. & H., of Iowa; A. Q., of N. Y.; C. K., of Iowa; L. F. D., of N. Y.; J. DeF., of France; C. S. L., of N. J.; T. & N., of Mass.; H. B., of Pa.; J. McK., of England; R. J. M., of N. Y.; J. S., of N. Y.; N. B. P., of N. Y. (3 cases); J. P. H., of N. Y.; D. L., of Pa.; H, M., of Mass.; J. W. R., of Conn.; T. H., of England.

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Models are required to accompany applications for Patents under the new law, the same as formerly, except on design patents when two good drawings are all that is required to accompany the petition, specification and oath, except the government fee.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and inclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

NEW PAMPHLETS IN GERMAN.—We have just issued a revised edition of our pamphlet of *Instructions to Inventors*, containing a digest of the fees required under the new Patent Law, &c., printed in the German language, which persons can have gratis upon application at this office. Address MUNN & CO.,
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A pamphlet of information concerning the proper course to be pursued in obtaining Patents through their Agency, the requirements of the Patent Office, &c., may be had gratis upon application at the Principal Office, or either of the Branches. They also furnish a Circular of information about Foreign Patents.

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Immediately after the appointment of Mr. Holt to the office of Post-master General of the United States, he addressed to us the subjoined very grateful testimonial:—

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Your obedient servant, J. HOLT.

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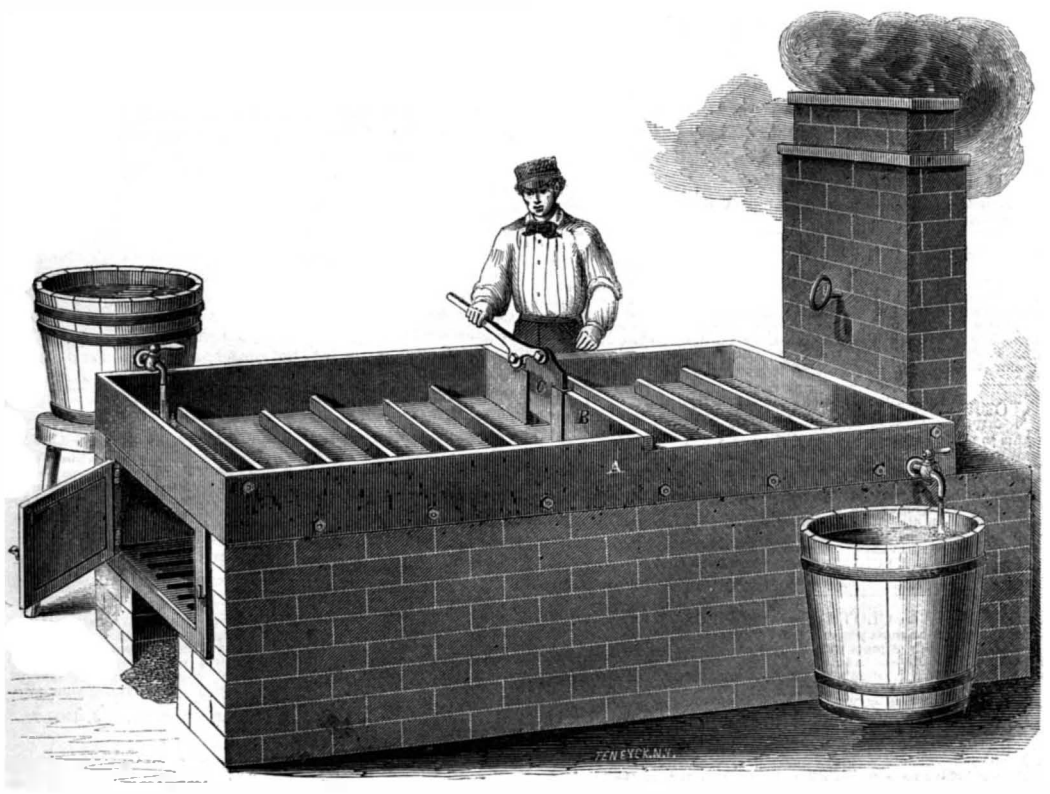
Improved Cane-Juice Evaporator.

On the 16th and 17th of April last, a large convention of sugar-cane growers was held at Adrian, in Michigan. The greatest amount of emulation on the occasion, was in relation to evaporators with which the saccharine juices are manufactured into sirup and sugar. Seven different evaporators were exhibited for competition, and the committee to whom the matter was submitted, after examining them all, gave their preference to the evaporator illustrated in the annexed engraving, the invention of C. Cory. It is constructed as follows :—A flat, rectangular pan of sheet copper or other suitable material, is set upon a brick furnace, with the bottom inclining slightly downward toward the chimney. The juice is poured into the pan at its upper end, and drawn off at the lower ; the evaporation of the watery portions taking place during the passage. The pan is nearly crossed by a series of partitions, the alternate ends of which, on either side, are cut away, forming a zigzag channel for the flow of the juice ; the channel being thus lengthened, and the juice exposed for a longer time to the action of the heat.



CORY'S CANE-JUICE EVAPORATOR.

At a point near the middle of the pan, where the heat is most intense, the ebullition is peculiarly violent, the juice being thrown up in the middle, and the scum falling off toward the sides. In order to prevent the scum from passing onward with the flow of the juice, Mr. Cory introduces a partition, B, at this point, extending across the pan, and forming an opening for the passage of the juice, provided with a gate, C, under the easy control of the operator, so that the juice may be kept back until the scum is removed, and may then be permitted to flow into the lower portion of the pan, where the evaporation is completed. A small quantity of lime is placed in the upper end of the pan, to free the juice from some of its acid and other impurities.

The advantages claimed for this evaporator are ease of management, speed of performance, saving of fuel, and perfect defecating and cooking qualities, producing a superior quality of sugar and sirup, at a low cost.

The patent for this invention was granted, through the Scientific American Patent Agency, September 10, 1861, and further information in relation to it, may be obtained by addressing the inventor, C. Cory & Sons, at Lima, Lagrange county, Ind.

Catching Tigers in Cochin China.

Many of the natives of Cochin obtain their livelihood by tiger catching, the skin of this animal being valuable. They use a novel mode of ensnaring those savage beasts. Two Malays generally go in company, and travel over many parts of the country. Those who follow this business regularly have permits from the Quong of Saigon, allowing them to build a hut for their use in any place they see fit. This hut is built on the top of four bamboos, from fifteen to twenty feet high, and as the tiger cannot climb these, the two men can remain in it and watch their snares in safety. The snare consists of large leaves, sometimes pieces of paper, of six inches square, covered on one side with a substance of the same nature as bird-lime, and containing a poison, the smallest portion of which, getting into the animal's eyes, causes instant blindness. They are laid about thickly, with the bird-lime side upward, in the track of a tiger, and as surely as the animal puts his paw upon one of the treacherous leaves, he becomes a victim ; for, finding it stuck to his foot, he shakes it, by which means other leaves adhere to it; he then probably rubs his paw over his head in his effort to rid himself of these leafy incumbrances, but they stick to his head and face; he then perhaps rolls himself upon the ground, when he becomes fairly covered, and while scratching and rubbing himself to get free some of the bird-lime the poison gets into his eyes and blinds him. He growls and roars in agony, and this is the signal for his captors to come up and despatch him. The Malays then skin the animal, and take away parts of the body that may be valuable. They leave the carcass, well strewn with leaves, as a bait for other tigers. Other animals they ensnare in the same manner.

Choice Violins.

Old and choice violins that have been made at Cremona, Italy, are held in high esteem, and some of them sell for extravagant prices. A sale of these lately took place on Leicester Square, London, the following account of which is given by the *Times* :—

Prominent among the violins were the well known instruments of the late Count Castelbarco, of Milan, to whom M. Fétis has dedicated his "Mémoire sur Stradiuarius." The following were the more remarkable lots, with the prices at which they sold :—Lot 1, a violin by Stradiuarius, date 1712, £70; lot 2, ditto, 1699, £56; lot 5, a tenor ditto, 1715, £100; lot 6, a violin ditto, 1701, £135; lot 8, 1685, £135; lot 9, ditto, 1713, £90; lot 12, violin by Nicolas Amati, 39 guineas; lot 13, a violin by Andreas Amati, 36 guineas; lot 29, a violincello by Stradiuarius, 1697, £210; lot 28, ditto, 1687, £115; lot 30, a violincello by Nicolas Amati, 1687, £130; lot 31, an autograph letter of the celebrated Stradiuarius, (fac-similed in Fétis "Memoir" of him), £8. The 17 articles of this collection produced the large sum of £1,239, 15s ($6,198).

Feeding Oats to Horses.

A correspondent of the Rural *Register* gives his experience as follows, on feeding horses. He says :—

The same quantity of oats given to a horse produces different effects according to the time they are administered. There is, decidedly, a great advantage in giving horses water before corn, and an injury in giving water after corn. There is a bad habit prevalent, namely, that of giving corn and hay on their return to the stable after hard work. Being very hungry, they devour it eagerly and do not masticate ; the consequence is, it is not so well digested. When a horse returns from work, perspiring and out of breath, he should be allowed to rest for a time, then give a little hay, a half an hour afterward water, then oats. By this plan water may be given without risk of cold. This correspondent states that he has made many experiments with his own horses, and the foregoing are conclusions based on his experience.

It is estimated that from 15,000 to 20,000 bales of cotton, of good staple, will be sent to market from Illinois the present year.

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FROM THE STEAM PRESS OF JOHN A GRAY

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